

CHAPTER 8.

LAND AND SUBMERGED LAND USE

8.1 AFFECTED ENVIRONMENT

This affected environment section defines the resource through descriptions of land ownership, management and land use, beginning with Government of Guam (GovGuam) land, followed by federal land and submerged lands (both GovGuam and Department of Defense [DoD]). The remaining property is assumed to be private land.

Submerged lands refer to areas in coastal waters extending from the Guam coastline into the ocean 3 nautical miles (nm) (5.6 kilometers) [km]. The remainder of Section 8.1 focuses on existing land uses at, or adjacent to, other areas potentially affected by the proposed action and alternatives. As points of reference, primary land use constraints are mentioned (e.g., Explosive Safety Quantity Distance [ESQD] arcs), but details are provided in other resource chapters of this Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS).

Land use discussions include DoD and civilian existing and planned land uses, and land use planning guidance that direct future development. On Guam, the federal government controls approximately one third of the land; therefore, the federal government exerts a notable influence over Guam land use.

The region of influence (ROI) for land use is land and ocean in the Territory of Guam within 3 nm (5.6 km) off shore, which is the limit of state or territorial jurisdiction. Other than the use of existing shipping lanes, the designated Ocean Dredged Material Disposal Site (ODMDS) and training ranges described in the Mariana Islands Range Complex (MIRC) EIS (Navy 2009), no Marine Corps actions are proposed beyond the submerged lands boundary.

8.1.1 Definition of Resource

8.1.1.1 Land Ownership and Management- Island-wide

Landowners on Guam are the United States (U.S.) Government, GovGuam, and private citizens at approximately 35%, 20%, and 48% of the land, respectively (Bureau of Statistics and Plans 2009). Private land ownership on Guam is not restricted on the basis of nationality or residency and title can be held in fee simple, which means the owner has the right to control, use, and transfer the property at will. Federal, GovGuam, and private lands are shown on Figure 8.1-1. Govguam lands include land used by the government of Guam for government operations, the Chamorro Land Trust Lands, and the Ancestral Lands Commission managed lands. Additional information is provided in the Socioeconomics Impact Assessment Study, see Appendix F of this EIS/OEIS.

The lands that are non-federal and non-GovGuam lands are assumed to be privately held. The northern area is characterized by large federal land holdings and a large portion of the island's residences. The central section of Guam is the most developed and urbanized, and includes the core tourist area at Tumon Bay. The southern portion of Guam contains large areas of undeveloped land, due in part to the steep terrain.

The following subsections describe the management policies for non-federal land followed by a discussion of federal government lands and submerged lands.

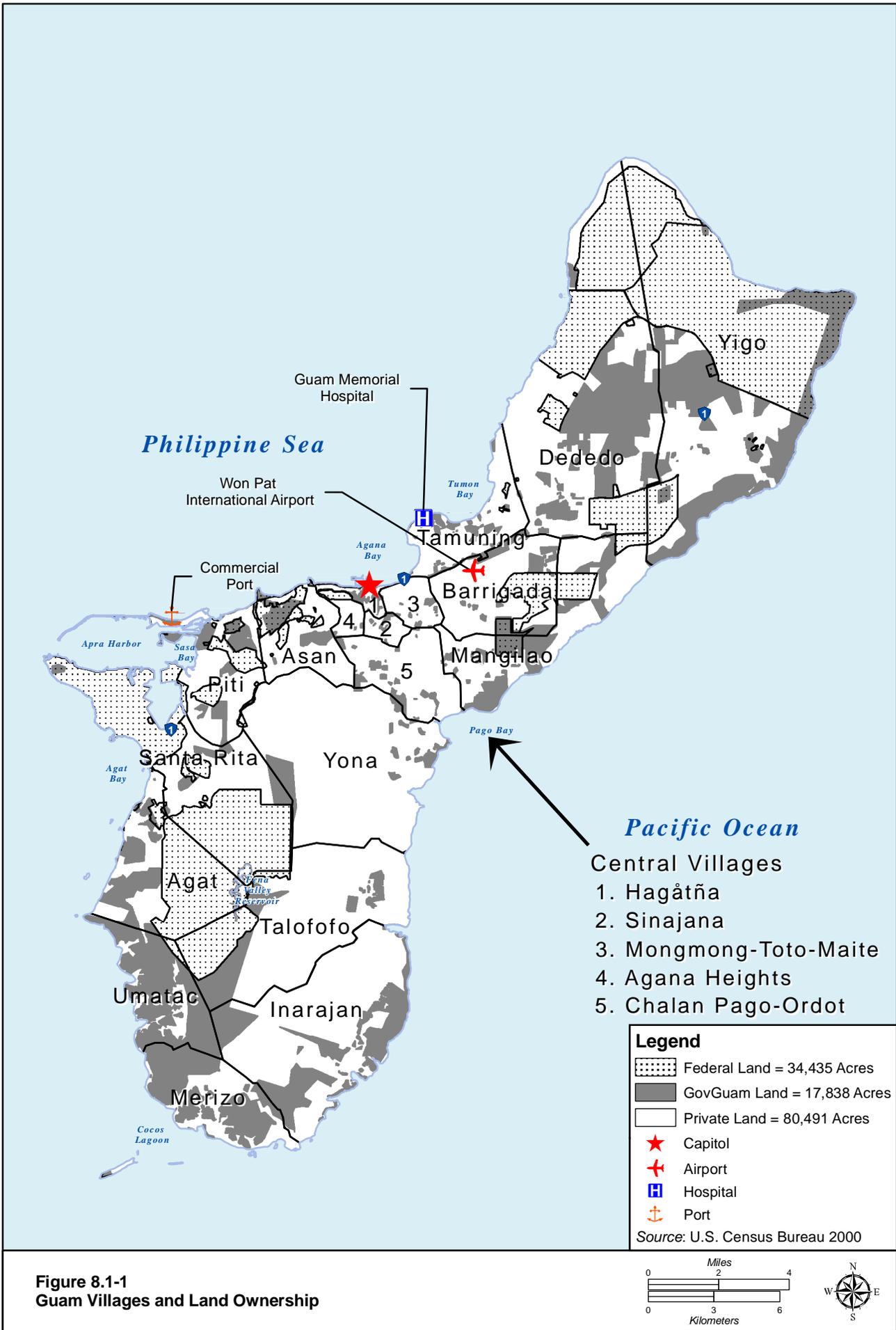


Figure 8.1-1
Guam Villages and Land Ownership

Non-Federal Land Management

The Organic Act of 1950 (48 Code of Federal Regulations [CFR] §1421) made Guam an organized, unincorporated territory of the U.S., conferring U.S. citizenship on the people of Guam and establishing local self-government. It is “unincorporated” because not all provisions of the U.S. Constitution apply to the territory. Guam is an “organized” territory because the Guam Organic Act of 1950 organized the government much as a constitution would. The Guam Organic Act provides a republican form of government with locally-elected executive and legislative branches and an appointed judicial branch. Guam also has an elected representative to Congress. Policy relations between Guam and the U.S. are under the jurisdiction of the Office of Insular Affairs.

The Chamorro Land Trust Commission (CLTC) and Guam Ancestral Lands Commission (GALC) have the primary responsibility for managing Guam's public lands. Comprehensive land use planning is the responsibility of the Bureau of Statistic and Plans. Other entities including the Department of Agriculture and Department of Parks and Recreation have land management functions specific to a land classification. The Department of Land Management (DLM) provides administrative support to two important commissions that oversee zoning and seashore clearance permits, etc. These are the Guam Land Use Commission (GLUC) and Guam Seashore Protection Commission (GSPC). Federal lands are not subject to DLM management or control, but consistency with surrounding non-federal land uses is an important consideration for land use planning on federal and non-federal lands.

There are ownership classifications within GovGuam lands based on historical land ownership. The key categories are as follows:

- Spanish Crown lands were owned by the former Spanish Crown (government). These lands are not subject to ancestral or other private claims of ownership rights (JGPO 2008), but may be subject to indigenous rights claims.
- Ancestral lands are Guam lands, previously privately-owned by residents of Guam on or after January 1930, and subsequently condemned for public purposes by either the Naval GovGuam or the U.S. These lands have been released as excess public lands in accordance with local and federal authorities. The Guam Ancestral Lands Commission (GALC) (within the DLM) is responsible for making determinations of claims and transferring ownership to ancestral claimants (JGPO 2008).
- Guam public lands are former Spanish Crown lands and other lands designated for public purposes, transferred from the Naval GovGuam and U.S. Department of Interior to the GovGuam as part of the Guam Organic Act (includes lands under the control of the GALC and Chamorro Land Trust Commission (within the DLM) (JGPO 2008).

Coastal Zone

The Coastal Zone Management Act (CZMA) was promulgated in 1972 as a means to “...preserve, protect, develop, and where possible, to restore or enhance, the resources of the Nation’s coastal zone for this and succeeding generations” through “...the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone, giving full consideration to ecological, cultural, historic, and esthetic values as well as the needs for compatible economic development...” (16 U.S. Code [USC] § 1451-1466 [2005]). The CZMA is administered through local programs in cooperation with the federal government.

Federal consistency requirements of the CZMA mandate that federal activities comply to the greatest extent possible with applicable local management programs. Non-federal activities must comply fully

with local management programs if they require a federal permit or license, or if they receive federal funding (15 CFR Part 930). Land/submerged land under federal jurisdiction is excluded from the territorial coastal zone. According to CZMA, federal activities that affect any land or submerged land use or natural resource of a territory's coastal zone shall be carried out in a manner that is consistent to the maximum extent practicable with the enforcement policies of the federally-approved territorial Coastal Zone Management Program.

The CZMA is administered on Guam by the Bureau of Statistics and Plans through the Guam Coastal Management Program (GCMP). The coastal zone on Guam includes all non-federal lands on the island, as well as offshore islands and non-federal submerged lands within 3 nm (5.6 km). The Navy would prepare a coastal zone Consistency Determination (which would cover all proposed action including Marine Corps, Navy and Army actions discussed in other volumes of this EIS/OEIS). Volume 9, Appendix H contains the consistency determination assessment and correspondence.

Federal Land Ownership and Management

Federal Land Ownership

The federal lands that are used by DoD represent approximately 29% of Guam's (refer to Figure 8.1-1) total land area, not including submerged lands (Government Affairs Office 2007). Andersen Air Force Base (AFB) (located in northern Guam) is the operational center for the Air Force on Guam. The Navy's mission-critical operations occur around Apra Harbor in the southwest. Both military services own other parcels that are not contiguous with the principal operating centers.

DoD land control has decreased over the past three decades as a result of the Guam Excess Land Act of 1994 and Base Realignment and Closure (BRAC) recommendations. The Guam Excess Land Act released DoD property to GovGuam that was declared to be excessive to military requirements under the Guam Land Use Plan (GLUP) 1977. BRAC is a Congressional program that has decreased the number of bases operated by the U.S. military. The former Naval Air Station Agana was closed in 1995, and the Navy transferred or released ownership of it to GovGuam and other government agencies as a result of BRAC. In 1997, BRAC realigned Naval Base Guam, which included the release of surplus/excess Navy military property determined to be excessive in the Guam Land Use Plan. The previous Naval Facility, at Ritidian Point, was transferred to the U.S. Fish and Wildlife Service. Other DoD parcels also have been, or are currently in the process of being, transferred to GovGuam. In addition, the Navy outleased the Former Navy Ship Repair Facility located within the Apra Harbor Naval Base to GovGuam for utilization as a commercial shipyard facility.

DoD Land Management – Joint Region Marianas

The 2005 BRAC mandates included a directive to realign DoD installation management functions on Guam to the Commander of the U.S. Naval Forces in the Mariana Islands. Currently, all installations employ military, civilian, and contractor personnel to perform common functions in support of installation facilities and personnel. Installations execute these functions using similar processes. There is significant opportunity to reduce duplication of efforts and achieve greater efficiencies through economies of scale. Overall manpower and facilities requirements would be reduced. The resulting organization created by this realignment is Joint Region Marianas. The Navy and Air Force would maintain their distinct missions and retain operational command, but regional installation support would be managed by the Navy, including:

- Planning, programming, budgeting, and execution
- Delivery of installation support – policies, procedures, and contracts

A Navy Admiral would command Joint Region Marianas, and the Navy would control and manage all real estate assets currently held by the Navy as well as those of the Air Force. Joint Region Marianas implementation is anticipated by the end of 2009. This EIS/OEIS describes infrastructure, land ownership, and permitting as they exist prior to implementation. This change in DoD land management would occur even if the proposed action analyzed in this EIS/OEIS were not implemented.

Submerged Lands Ownership and Use

This section is a discussion of regional submerged lands use. The nearshore submerged lands discussion is presented in 8.1.3 and organized by specific geographic areas.

Submerged Lands Ownership

Territorial waters or submerged lands refer to coastal waters, together with the seabed beneath them and the airspace above them, over which a state claims sovereignty. For Guam, this area extends 3 nm (5.6 km) from the coastline into the ocean (Figure 8.1-2) (National Oceanic and Atmospheric Administration [NOAA] 2007). Although GovGuam has jurisdiction over the majority of submerged lands, the remainder of submerged lands are under federal jurisdiction, primarily for DoD use (see Figure 8.1-2). These DoD submerged lands border existing or past Navy and Air Force coastal land holdings and are managed by the Navy per Presidential Proclamation 4347 of 1975. The federal government has overarching authority over state and territorial waters to regulate navigation, power generation, national defense, and other activities from 0 to 12 nm (0 to 22.2 km) from shore, inclusive of submerged lands.

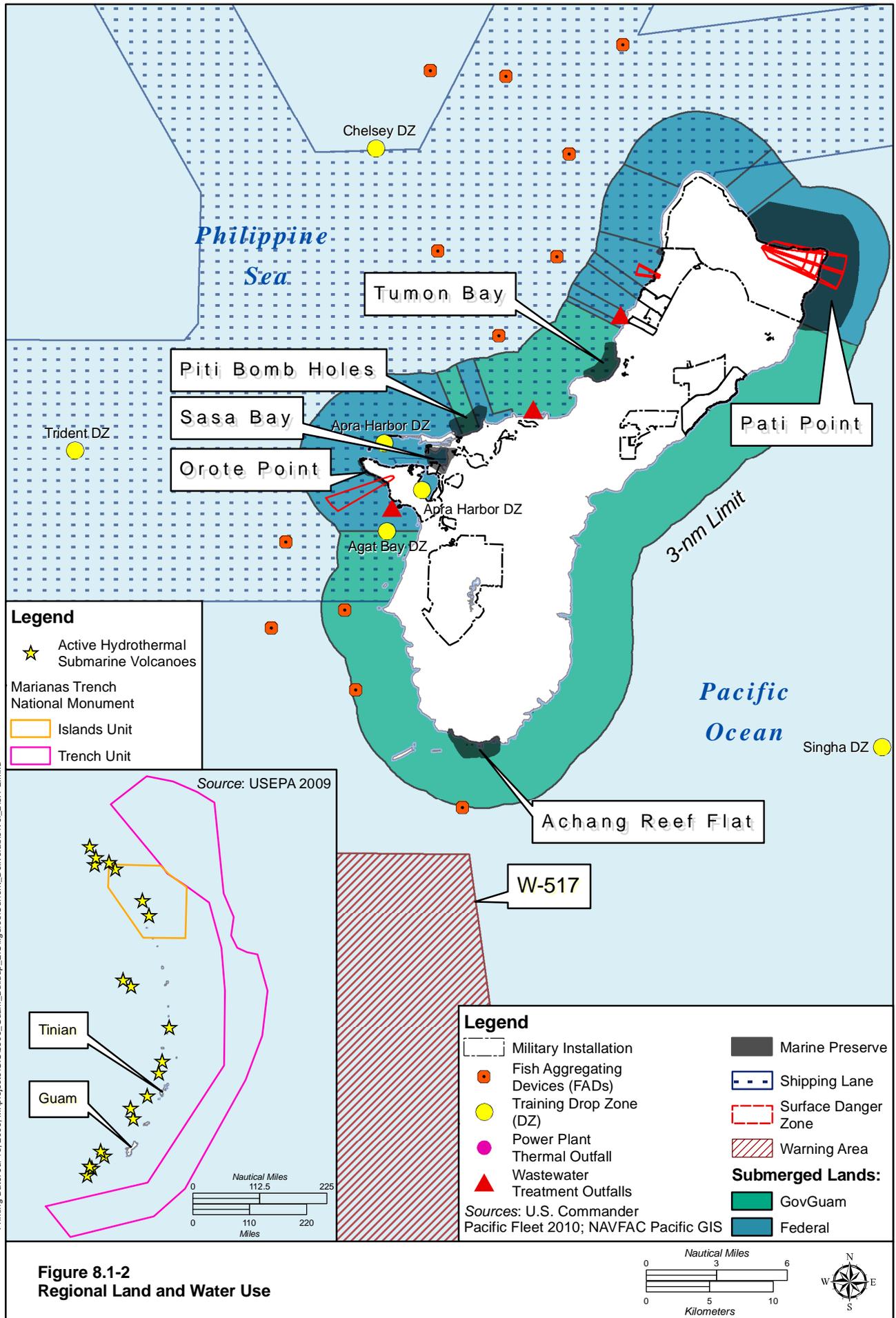
Exclusive Economic Zones of coastal countries (including territories) extend from 12 to 200 nm (22 to 370 km) beyond the ROI for the land use analysis in this EIS/OEIS. Other than the use of existing shipping lanes, the designated ODMDS, and training ranges described in the MIRC EIS/OEIS, no Marine Corps actions are proposed beyond the submerged lands boundary. The MIRC and ODMDS land ownership and use impacts are addressed under their respective EISs (Navy 2009, USEPA 2009). Shipping is addressed in Chapter 14 Marine Transportation of this Volume. The coastal nation has sovereign rights to exploring, conserving, and managing living and nonliving resources within the Exclusive Economic Zones.

Submerged Land Use (Island-wide)

Submerged land uses outside the harbor include shipping lanes, fish-aggregating devices that support recreational and commercial fishing, other recreational uses, and military training sites (see Figure 8.1-2). The USEPA designated (pending) ODMDS is located more than 9 nm (17 km) west of Apra Harbor and beyond the ROI for the land use discussion. The ODMDS EIS record of decision is anticipated in 2010. The recreational resources and natural resources affected environment of submerged lands is described in other chapters of this EIS/OEIS.

Marine Protected Areas

Guam's legislature has delegated the authority and responsibility of management and oversight for all aquatic and wildlife resources to the Guam Department of Agriculture, Division of Aquatics and Wildlife Resources (GDAWR). In May 1997, GovGuam created five marine preserves under Public Law 24-21 (see Figure 8.1-2). These five marine preserves are Tumon Bay, Piti Bomb Holes, Sasa Bay, Achang Reef Flat, and Pati Point, totaling over 10% of Guam's coastline. The sizes of the preserves vary, but all preserves extend from 33 feet (ft) (10 meters [m]) above the mean high tide mark to the 600 ft (183 m) depth contour. Federal submerged lands overlap with the Sasa Bay and Piti Bomb Holes marine preserves. The federal government does not acknowledge that the federal submerged lands can be



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designated GovGuam marine preserves and is not bound to comply with land use constraints associated with the preserves.

Fish-aggregating devices are established around Guam to attract fish, and have become popular fishing spots. Locations are shown on Figure 8.1-2 and fishing is discussed in Volume 2, Chapter 9, Recreational Resources of this EIS/OEIS.

Military Training Areas

Military training areas in submerged lands around Guam support amphibious, anti-submarine, and special forces training. These training areas provide capability for water drop zones and amphibious landing sites, paratrooper insertion/extraction, explosive detonation sites for training in anti-mine warfare and underwater explosives used for obstacle removal, W-517 special use airspace, and surface danger zones associated with firing ranges on land as shown on Figure 8.1-2 (Navy 2009). A Notice to Mariners (NOTMAR) and Notice to Airmen (NOTAM) are issued when these facilities are in use and access is restricted. Additional training facilities are described in this section under specific geographic areas.

Marianas Trench Marine National Monument

The Marianas Trench Marine National Monument (the 'Monument') was established in January 2009 by Presidential Proclamation under the authority of the Antiquities Act (16 USC 431) (Navy 2009). The Monument consists of approximately 71,897 square nm (246,600 square km [km²]) of submerged lands and waters of the Mariana Archipelago and was designated with the purpose of protecting the submerged volcanic areas of the Mariana Ridge, the coral reef ecosystems of the waters surrounding the islands of Farallon de Pajaros, Maug, and Asuncion in the Commonwealth of the Northern Mariana Islands (CNMI), and the Mariana Trench. The monument includes three units as follows (see Figure 8.1-2):

- Islands Unit - waters and submerged lands of the three northernmost Mariana Islands
- Trench Unit - Mariana Trench area
- Volcanic Unit - submerged lands of active hydrothermal submarine volcanoes

The Presidential Proclamation establishing the Monument includes the following language regarding military activities in the area:

1. The prohibitions required by the Proclamation shall not apply to activities and exercises of the Armed Forces (including those carried out by the U.S. Coast Guard [USCG]).
2. The Armed Forces shall ensure, by the adoption of appropriate measures not impairing operations or operational capabilities, that its vessels and aircraft act in a manner consistent, so far as is reasonable and practicable, with the Proclamation.
3. In the event of threatened or actual destruction of, loss of, or injury to a monument living marine resource resulting from an incident, including, but not limited to spills and groundings, caused by a component of the DoD or the USCG, the cognizant component shall promptly coordinate with the Secretary of the Interior or Secretary of Commerce, as appropriate. This requirement is for the purpose of taking appropriate response actions to mitigate any actual harm and, if possible, restore or replace the monument resource or quality.
4. Nothing in the Proclamation, or any regulation implementing it, shall limit or otherwise affect the Armed Forces' discretion to use, maintain, improve, manage, or control any property under the administrative control of a Military Department or otherwise limit the availability of such property for military mission purposes.

The Secretary of Commerce, through NOAA and the Interior, shall manage the Monument pursuant to applicable legal authorities and in consultation with the Secretary of Defense. Under the Proclamation, the Secretaries of the Interior and Commerce shall, within two years of the date of the Proclamation, prepare management plans within their respective authorities and promulgate implementing regulations that address any further actions necessary for the proper care and management of the objects identified in the Proclamation. In developing and implementing any management plans and any management rules and regulations, the Secretaries shall designate and involve as cooperating agencies the agencies with jurisdiction or special expertise, including DoD, the Department of State, and other agencies through scoping in accordance with the National Environmental Policy Act (42 USC 4321 et seq.), its implementing regulations and with Executive Order (EO) 13352 of August 26, 2004, Facilitation of Cooperative Conservation, and shall treat as a cooperating agency the Government of the CNMI, consistent with these authorities. The monument management plans shall ensure that the monument would be administered in accordance with the Proclamation.

According to the Proclamation, the management plans and their implementing regulations shall impose no restrictions on innocent passage in the territorial sea or otherwise restrict navigation, overflight, and other internationally recognized lawful uses of the sea, and shall incorporate the provisions of the Proclamation regarding Armed Forces actions and compliance with international law.

Ammunition Handling

Kilo Wharf is located near the Outer Apra Harbor entrance. It is the only DoD munitions wharf at Apra Harbor. Though it generates an explosive safety distance arc that overlaps the harbor traffic route, ship traffic is allowed to proceed through the arc under a Chief of Naval Operations (CNO) exemption. Depending on the quantity of explosives being handled at Kilo Wharf, recreational access to areas east of Kilo Wharf is restricted. Recreational access is addressed in another section. A NOTAM is issued when activities are restricted.

8.1.1.2 Land Use

GovGuam

Municipalities

Guam is divided into 19 municipalities, referred to as villages, and each one is governed by an elected Mayor. The villages are shown on Figure 8.1-1. The villages vary by size and population as shown on the figure. The northern area has the fewest number of villages, but has the greatest regional population (approximately 52%) on 34% of the land. The central area has the greatest number of villages on only 20% of the island. The south region has most of the regional land area (approximately 46%) and the smallest population at 16% (U.S. Census Bureau 2000). Most of the island remains in a relatively rural state with the urbanized areas concentrated around Tamuning and Hagatna. The southern portion of the island contains large expanses of undeveloped land, due in part to the steep terrain.

Guam Land Use Plan

Land use plans include goals, objectives, and maps to guide future development, and describe existing land uses at a point in time. Recognizing that community objectives and land use planning requirements change over time, plans are prepared to address development for a specific duration, such as 5 years or 10 years. The plans lay the foundation for zoning regulations. Federal lands are excluded from Guam land use planning unless there is anticipated release of federal lands. The Territory of Guam Master Plan that

was prepared for the Territorial Planning Commission in 1966 is the adopted land use plan for Guam (Figure 8.1-3).

Other plans have been developed such as the Guam Comprehensive Development Plan (1977) and *I Tano-ta* (Territorial Planning Council 1994). The 1977 Plan was valid for a planning period up to the year 2000, but the *I Tano-ta* was not adopted (Bureau of Statistics and Plans 2008). These plans provide valuable information on existing and planned land uses at various points in time.

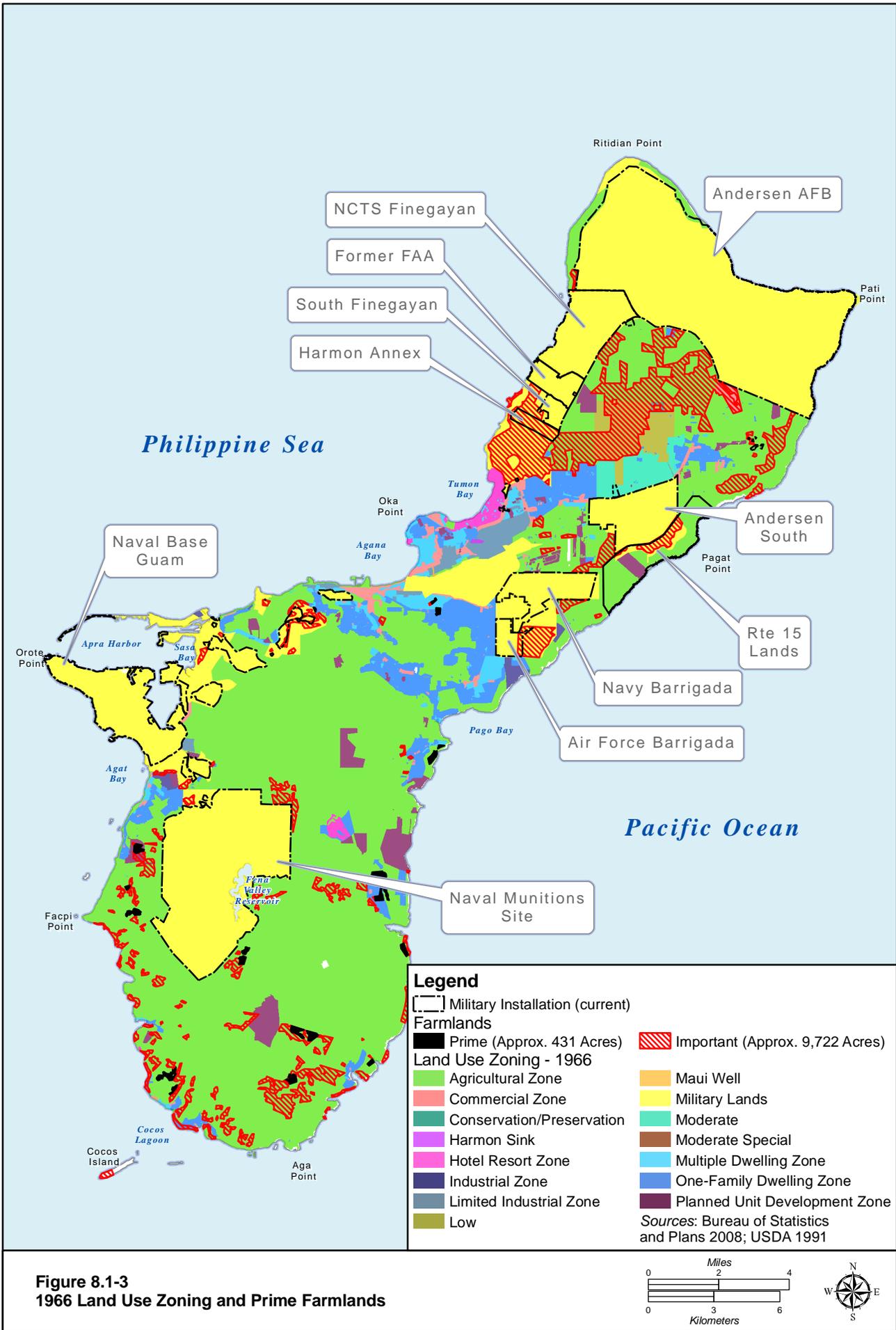
Although the 1966 land use plan is the official land use plan, it has limited utility when describing existing land use and trends for future development. The Guam Mapbook (Bureau of Statistics and Plans 2008) is based on aerial photography and is a better resource for assessing current land use. The general land uses can be discerned from the photographs, such as:

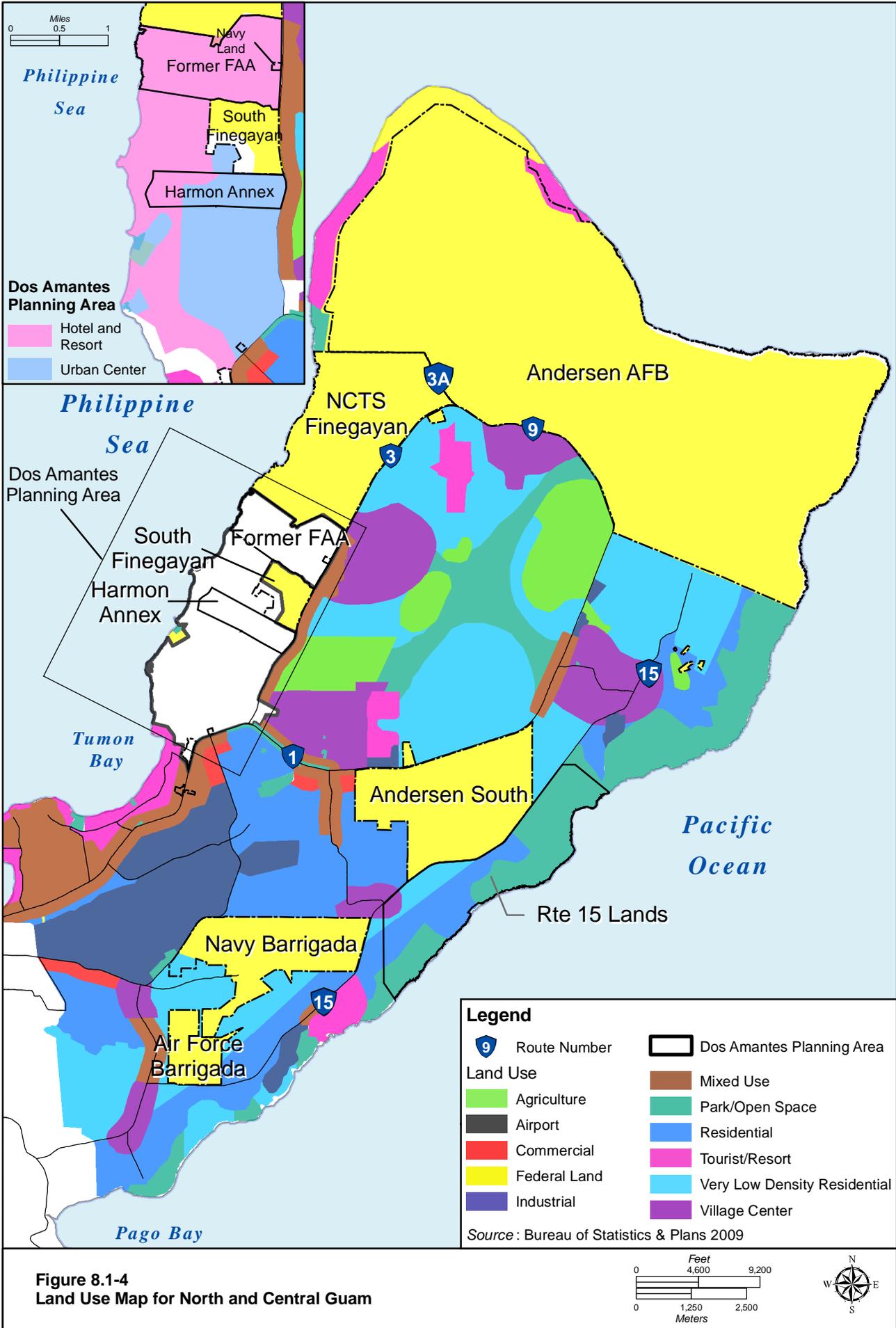
- residential neighborhoods
- vacant lands – vegetated or disturbed, no modern manmade structures
- roads

The Bureau of Statistics and Plans prepared the *North and Central Guam Land Use Plan* (Bureau of Statistics and Plans 2009). Figure 8.1-4 is the *North and Central Guam Land Use Plan* map from the final report. This plan has not been adopted by legislature, but represents the best available land use planning information and public input through a public hearing process. The land use designations are:

- Very Low Density Residential - generally less than one housing unit per acres.
- Residential – a range of residential development, including single-family homes and apartment buildings. Might include neighborhood –sized commercial development.
- Mixed Use - larger commercial centers serving large areas of the island that might include shopping malls, hotels, and office buildings.
- Dos Amantes Planning Area – the *Land Use Master Plan for the Dos Amantes Planning Area* (GALC 2005) identifies two land uses: Hotel and Resort, and Urban Center (refer to Figure 8.1-4). The zoning could include residential, commercial, industrial and tourist- resort land uses. The plan was not adopted by legislature.
- Village Center – a mix of residential, commercial, public facility, and open space at the scale and pattern that is consistent with Chamorro villages.
- Tourist/Resort – commercial facilities (hotels, golf courses, retail) to support the traveling public.
- Airport – Guam International Airport and adjacent industrial uses.
- Industrial – includes facilities to support manufacturing and processing, wholesaling, large storage, and mineral extraction.
- Agriculture – provides for agricultural uses intended to maintain the long-term viability of agricultural activities.
- Park/Open Space – encompasses existing and future parks, recreational, conservation, and natural open space and cultural resource areas.
- Federal Land – includes military use and federal parks. Land use designations listed above are not applied to federal land.

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The *North and Central Guam Land Use Plan* is intended to establish a general land use pattern to guide future land use development in the central and northern areas of Guam. It provides the basis for and is implemented by future zoning code development.

Based on the *North and Central Guam Land Use Plan* land use map (Figure 8.1-4); federal lands are predominantly bordered by residential land use. Park/Open space is designated along coastlines and within the area defined by Routes 3, 9 and 1. The Agriculture designation is limited to four non-contiguous areas between Routes 1 and 9. There are seven Village Center designated areas, three of which share part of a border with federal lands. Tourist/Resort areas are mostly along the coast with some exceptions like the area north of Andersen South and an area between Routes 3 and 9.

Guam Zoning

Zoning designations regulate the use, type, intensity and coverage for individual parcels or development project areas. Zoning regulations and permitting are not applicable to federal lands development. The zoning code is designed to be consistent with the overarching land use plans that are developed. The current zoning code for Guam contains regulations on land uses, heights, yards and building area, parking, signage, and administration of the code. The Zoning Code has been modified over the years since 1952. The zoning code establishes the following zoning districts (21 Guam Code Annotated [GCA] § 61201):

- “A” Rural Zone – This zone allows agricultural uses, single-family dwellings, duplexes, and uses considered accessory to these.
- “R1” One-Family Dwelling Zone – Primarily for single-family dwellings, this zone allows schools, churches, parks, and health services as conditional uses.
- “R2” Multiple Dwelling Zone – This zone allows duplexes and multi-family residential uses, as well as single-family dwellings and hotels.
- “C” Commercial Zone – In addition to typical commercial uses, this zone also allows single- and multiple-family dwelling units.
- “P” Automobile Parking Zone – This zone is intended for commercial and public parking and garages, as well as service vehicle storage.
- “M1” Limited Industrial Zone – This zone allows light manufacturing (drugs, cosmetics, food products), as well as auto repair facilities, warehouses and other similar uses. Packaging of fish or meat products, including fat rendering, is not allowed.
- “M2” Industrial Zone – The Heavy Industrial Zone allows all uses not specifically prohibited by law.
- “LC” Limited Commercial Zone – While the LC zone is listed in § 61201 as an established zone, the code does not contain regulations enumerating specifically allowed uses in this zone.
- “H” Hotel-Resort Zone – The Hotel-Resort Zone is geared toward tourism-related activities, and all associated uses are conditional in nature.
- “S-1” School Zone – Established for public schools and related facilities.
- “PF” Public Facility Zone – The Public Facility zone is intended for schools, police and fire stations, community centers, and other public or government facilities.

The Bureau of Statistics and Plans provided electronic versions of the 1966 zoning maps that are being reviewed by the DLM. These zones and their designations are represented in Figure 8.1-3, as provided by the Bureau of Statistics and Plans. There have been many changes to land use on Guam since 1966 that are not reflected in Figure 8.1-4.

Farmlands

Agricultural lands have been reduced by encroachment of residential development. Continued urbanization escalates land values, making it more difficult and expensive to sustain viable agricultural operations. Other factors affecting declining agriculture include shortages of water, inadequate labor supply, high cost, and local unavailability of agricultural inputs (Territorial Planning Council 1994). As the threat increases to prime agricultural land, the need for agricultural production also increases. Prime farmland, as defined by the U.S. Department of Agriculture (USDA), is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban, developed, or water areas. According to the Guam Land Conservation Act (5 GCA Government Operations, Chapter 65) prime agricultural land means any of the following:

1. Land which supports livestock used for the production of food and fiber and which has an actual carrying capacity equivalent to at least one animal unit per acre as defined by the USDA.
2. Land planted with fruit or nut-bearing trees, vines, bushes or crops which have a non-bearing period of less than five years and which would normally return during the commercial bearing period on an annual basis from the production of unprocessed agricultural plant production not less than two hundred dollars (\$200) per acre (ac).
3. Land which has returned from the production of unprocessed agricultural plant products an annual gross value of not less than two hundred dollars (\$200) per ac for three of the previous five years.

In addition to prime farmlands, land that does not meet the criteria for prime or unique farmland is considered to be “farmland of statewide importance” for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating these “important farmlands” are determined by the appropriate State agencies. Generally, this land includes areas of soils that almost meet the requirements for prime farmland, and that produce high yields of crops when treated and managed according to acceptable farming methods. One of the goals of the 1966 and subsequent (unadopted) land use plan is the protection of prime agricultural areas, as identified by the USDA, Natural Resources Conservation Service (formerly U.S. Soil Conservation Service). Federal lands do not have USDA farmland designations. Lands that are designated prime and important are generally not in production on Guam and local planning efforts may not seek to preserve all prime and important farmlands for agriculture.

There are farming activities on GovGuam, federal, and private lands that do not necessarily correspond to land use planning maps and USDA prime and important farmland designations.

There are farming activities on GovGuam, federal and private lands that do not necessarily correspond to land use planning maps and USDA prime and important farmland designations.

Figure 8.1-3 shows prime and important farmlands (USDA 1991). Military lands on Guam are not assigned a farmlands designation. The *North and Central Guam Land Use Plan* (Bureau of Labor and Statistics 2009) states a goal as follows: “Preserve agricultural lands and encourage expansion of market opportunities for local crops and products.” One of the policies to support this goal is: “Policy LU-12- Consider measures to preserve agricultural lands through land use categories, zoning, restrictions on non-agricultural uses in farming areas, agricultural easements, right-to-farm ordinances and other measures.”

There are farming activities on GovGuam, federal and private lands that do not necessarily correspond to land use planning maps and USDA prime and important farmland designations.

Non-DoD Parcels Relevant to Proposed Action

The non-DoD lands of potential interest to DoD are in the vicinity of South Finegayan on the west coast of Guam, south of NMS in southern Guam, and Andersen South near the east coast. Table 8.1-1 summarizes the characteristics of the non-DoD parcels of interest.

Table 8.1-1. Non-DoD Parcels of Interest

<i>Parcel Name</i>	<i>Owner</i>	<i>Current Use</i>	<i>Approximate Area (acre)</i>
West Coast			
Former Federal Aviation Administration (FAA) housing parcel, includes 5 acre Navy parcel	Private owners and GovGuam	Vacant (i.e., no modern manmade structures)	680 ¹
Harmon	Multiple ancestral claimants, private owners and GovGuam	Vacant – but for a few abandoned buildings	326 ¹
Piti/Cabras (Volume 6)	GovGuam	Vacant but for a few abandoned buildings	105 required, site has not been delineated
East Coast			
Route 15 lands, located east of Andersen South	Private owners and GovGuam. Possible ancestral lands claims	Vacant, isolated residences, International Raceway Park	1,100-1,800 ²
South			
Access road to NMS	Private land owners/GovGuam	Vacant, dirt path	2 alternatives (1.9) ¹

Sources: ¹ TEC 2009, ² NAVFAC Pacific 2009.

Former Federal Aviation Administration (FAA) land lies between NCTS and South Finegayan. The land was released by the federal government to GovGuam. Approximately, 5 ac (2 hectares [ha]) of land bordering Route 3 within the Former FAA area were retained by the Navy. The acreage calculations in the EIS/OEIS include the small parcel of Navy land within the Former FAA property.

DoD Parcels Relevant to Proposed Action

Non-contiguous DoD land holdings are dispersed throughout Guam. DoD land use (presented in Table 8.1-2) is organized into four regions of Guam: North, Central, Apra Harbor, and South, and DoD properties are shown on Figure 8.1-5. Table 8.1-2 also indicates whether the site would be improved under the proposed action.

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Figure 8.1-5
DoD Land and Non-DoD Lands of Interest

Table 8.1-2. Summary of DoD Parcels

<i>Parcel Name</i>	<i>Military Service</i>	<i>Primary Land Uses</i>	<i>Approximate Area ac (ha)</i>	<i>Proposed Action?</i>
North				
NCTS Finegayan	Navy	NCTS headquarters and receivers, housing, community support, training	2,415 (977)	yes
South Finegayan	Navy	Family housing	290 (117)	yes
Mount Santa Rosa	Air Force	Radar antennas	18 (7)	no
Andersen AFB	Air Force	Airfield operations and training (Main Base and Northwest Field), headquarters, training, administrative, housing, community support, munitions storage	15,401(6,233)	yes
Potts Junction	Air Force	Vacant- no modern manmade structures	20 (8)	yes
Central				
Navy Barrigada	Navy	NCTS transmitters, Navy golf course, Guam Army National Guard	1,417 (573)	yes
Air Force Barrigada	Air Force	Next Generations Radar - weather radar	432 (175)	yes
Andersen South	Air Force	Urban warfare training	2,061(834)	yes
Naval Hospital	Navy	Hospital, bachelor and family housing and DoD high school	120 (49)	no
Nimitz Hill	Navy	Family housing	199 (81)	no
Tenjo Vista & Sasa Valley	Navy	Fuel storage, including 27 underground tanks	421 (170)	no
Apra Harbor				
Navy Base Guam	Navy	Industrial waterfront, Glass Breakwater, Polaris Point, fueling wharves, USCG, headquarters, administrative, bachelor and family housing, community support, supply, training, maintenance and warehousing	3,429 ¹ (1,388)	yes
South				
Apra Heights/New Apra Heights	Navy	Family housing	242 (98)	no
Naval Munitions Site	Navy	Munitions storage, training	8,645 (3,499)	yes

Sources: ¹NAVFAC Pacific 2008b, TEC 2009.

Areas that are potential locations, or adjacent to potential locations, for proposed action improvements are discussed in further detail below.

The affected environment land use discussion focuses on areas on Guam that are relevant to the proposed action. The discussion is organized by geographic area.

8.1.2 North

The sources of land use information for northern Guam are as follows:

- Guam Mapbook (Bureau of Statistics and Plans 2008) - existing land use
- North and Central Guam Land Use Plan (Bureau of Statistics and Plans 2009) – trends in future lands use
- Land Use Master Plan for the Dos Amantes Planning Area (GALC 2005) – land use plan for specific project area located within the *North and Central Guam Land Use Plan* planning area
- Base maps provided by NAVFAC Pacific – existing military land use

- MIRC EIS/OEIS (Navy 2009) – military training facilities and use
- USDA Prime and Important Farmlands (USDA 1991) – farmlands
- Other references are cited as appropriate

8.1.2.1 Andersen AFB

Andersen AFB is one of the largest Air Force airfields comprising approximately 15,423 ac (6,242 ha) of federal government land on Guam. There is one primary access point to Andersen AFB, located at the intersection of Routes 1 and 9 near the eastern portion of the installation (Figure 8.1-6). A secondary gate, referred to as the Santa Rosa Gate, is on Route 15. Navy submerged lands are located along the entire northern Guam coastline adjacent to Andersen AFB. The Air Force does not operate a harbor or a marina; however, there are military recreational beaches designated along the northern coast at the western end of the Pati Point Marine Protected Area (Figure 8.1-6).

The *Andersen Air Force General Plan* provides the framework for siting programming and constructing the 36th Wing mission (Air Force 2005). One of the goals in the plan is to “...ensure that facilities and land uses are adaptable and can expand to accommodate new missions, weapons systems and training.” The Air Force plans new facilities that are consistent with existing base land use plans, goals and objectives.

There are three main areas of Andersen AFB (see Figure 8.1-6) that are aligned east to west, these are the Main Base to the east, the Munitions Storage Areas (MSA) in the center, and NWF to the west.

Main Base

The predominant land use at Andersen Main Base (approximately 1,750 ac [708 ha]) is the airfield, which is bordered by industrial, maintenance, and aircraft operations facilities and infrastructure. Main Base also contains administrative facilities, headquarters, maintenance, housing, open space, and community support facilities. The development pattern of Main Base is low-density characterized by individual buildings with substantial setbacks. Most structures are two stories in height or less. Bachelor Housing is four stories. A land use plan developed by Andersen AFB for Main Base is shown in Figure 8.1-7.

There are two parallel runways aligned in the northeast-southwest direction: 1) Runway 06L/24R is 11,185-ft long (3,411-m) and 200-ft (61-m) wide, and 2) Runway 06R/24L is 10,558-ft (3,220-m) long and 200-ft (61-m) wide. North Ramp facilities are north of the runways and South Ramp south of the runways. A Navy helicopter squadron uses facilities on the North Ramp. Fixed-wing aircraft support is on the South Ramp. Sensitive-receptor land uses (e.g., hospitals, ballfields, schools, housing) are developed away from the airfield to the extent practical to minimize noise impact. Facilities exposed to elevated noise levels that are determined to represent a potential health risk are constructed or retrofitted with noise attenuating features.

Tarague CATM Range, also known as the Pati Point Range, generates an SDZ to the northeast that lies partially within Navy submerged land. The range consists of 21 ac (8.5 ha) and is used for the small arms range. The range supports training with pistols, rifles, machine guns up to 7.62 mm, and inert mortars up to 60 mm. Training is also conducted with the M203 40mm grenade launcher using inert training projectiles only. An Explosives Ordnance Disposal (EOD) site is located northeast of the small arms range.

MSA

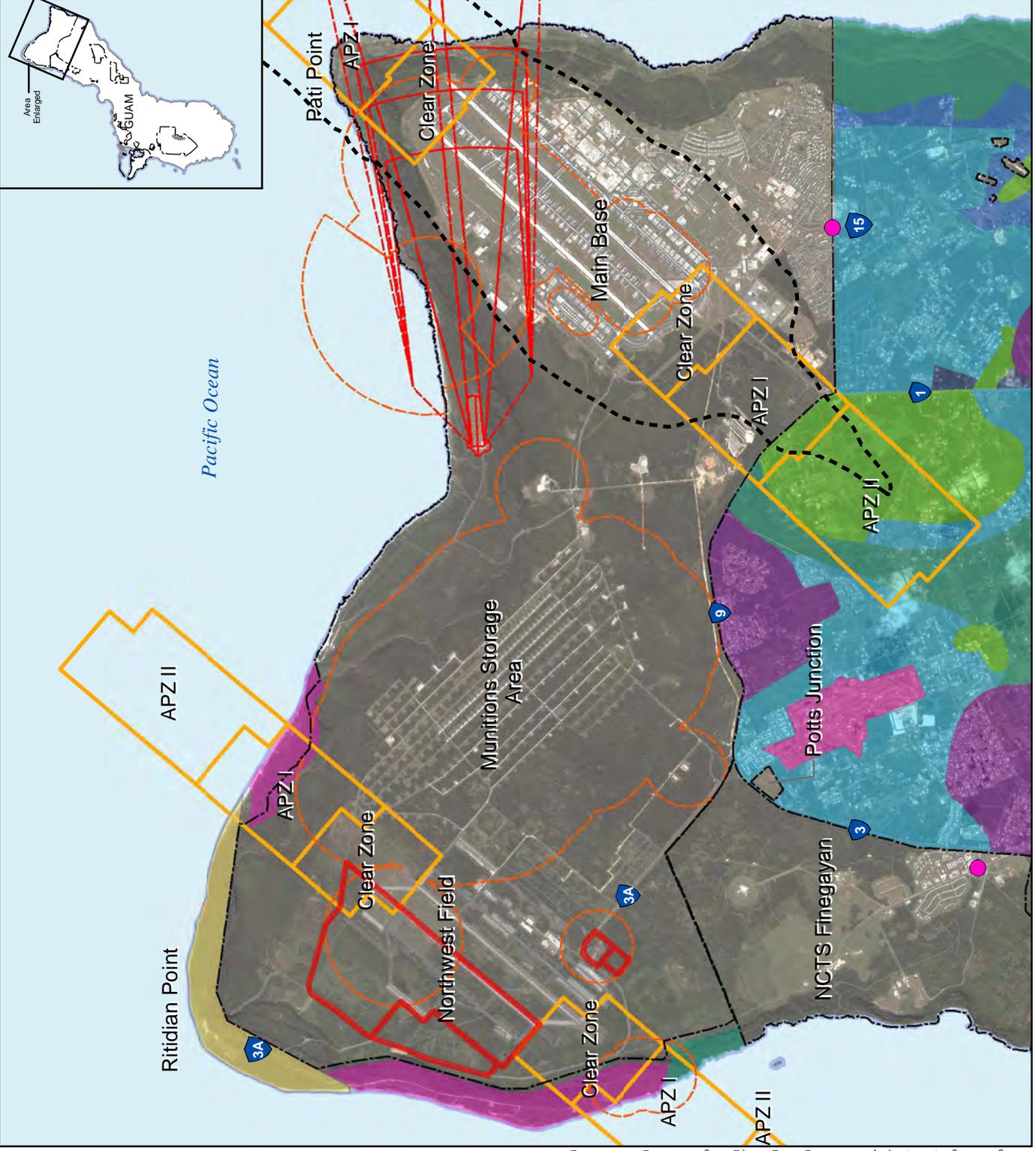
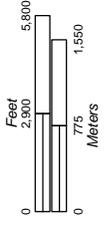
Explosives handling and storage is the primary function of the MSA. Facilities in the MSA generate ESQD arcs in the center of Andersen AFB as shown on Figure 8.1-6.

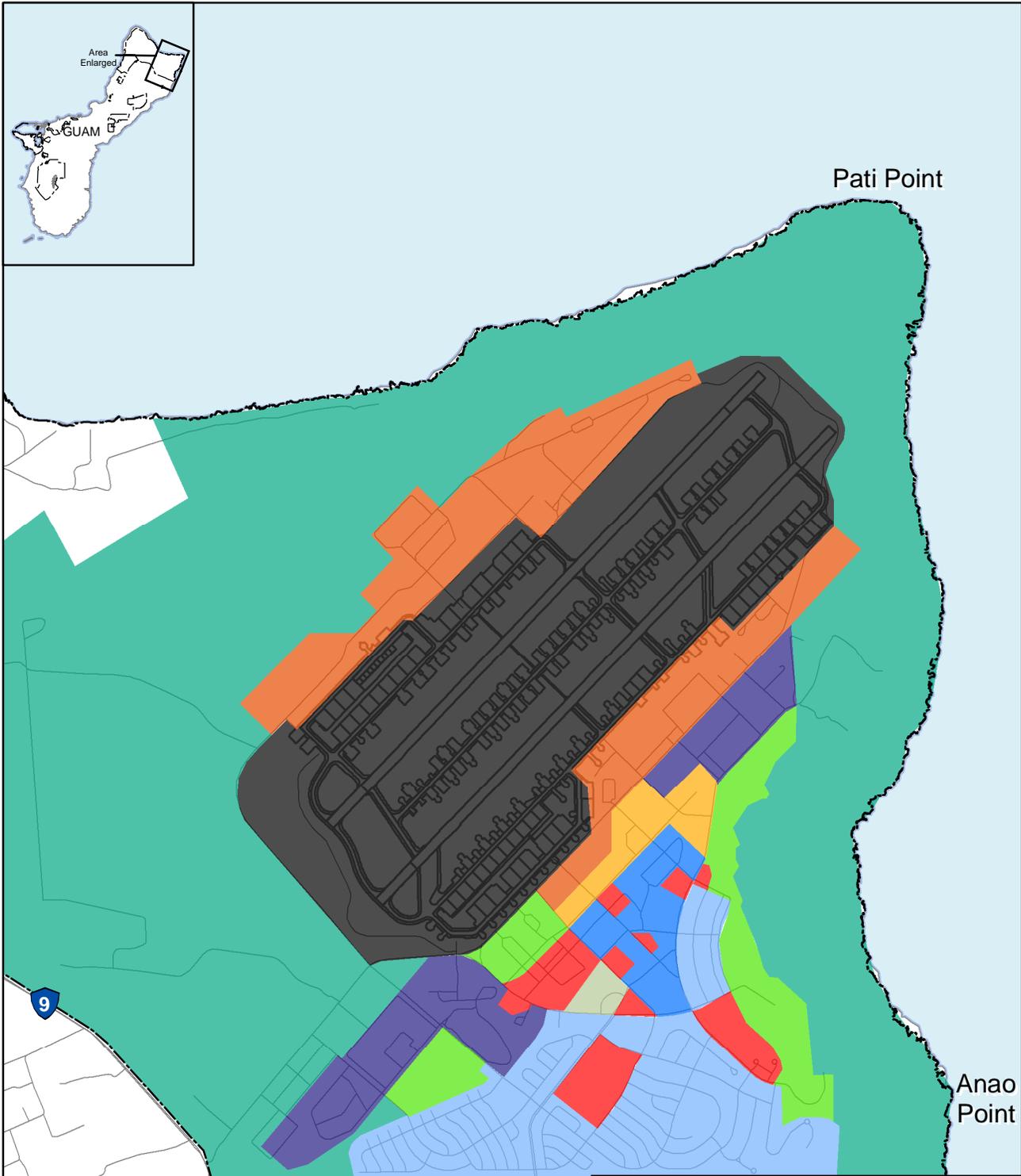
Figure 8.1-6
Andersen AFB
Land Use (General)

Legend

-  Military Installation
-  Route Number
-  Accident Potential Zones
-  Live Firing Range
-  SDZ
-  70 dBA Noise Contour
-  Existing ESQD Arc
-  Access Gate
-  Northwest Field Training & Support Area Boundary
-  Recovery Habitat
-  Land Use
-  Agriculture
-  Commercial
-  Industrial
-  Mixed Use
-  Park/Open Space
-  Residential
-  Tourist/Resort
-  Very Low Density Residential
-  Village Center

Source: Bureau of Statistic & Plans 2009





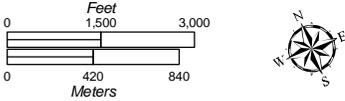
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Legend

- | | |
|-----------------------|-------------------------|
| Military Installation | Route Number |
| Land Use | Medical |
| Administrative | Housing (Accompanied) |
| Air Ops/Maintenance | Housing (Unaccompanied) |
| Community | Park/Open Space |
| Airfield | Recreation |
| Industrial | |

Source: Andersen AFB 2008

**Figure 8.1-7
Andersen AFB Main Base Land Use Plan**



The ESQD arcs restrict the construction of inhabited buildings and other non-munitions related activities.

Northwest Field (NWF)

NWF is approximately 4,400 ac (1,776 ha) and is located to the west of the MSA (Figure 8.1-8).

The base developed a NWF land use plan as shown in Figure 8.1-8. NWF is a World War II-era airfield. There are two paved expeditionary 10,000-ft (3,048-m) runways, with adjacent taxiways, and parking areas that have not been renovated since they were constructed in 1945. NWF serves as the primary maneuver training area available at Andersen AFB for field exercises and helicopter operations. The airfield is used for vertical and short field aviation landings. Approximately 280 ac (113 ha) of land are cleared near the eastern end of both runways for parachute drop training. The south runway is used for training of short field and vertical lift aircraft and often supports various types of ground maneuver training. Helicopter units use other paved surfaces for Confined Area Landing, simulated amphibious ship helicopter deck landings, and insertions and extractions of small maneuver teams.

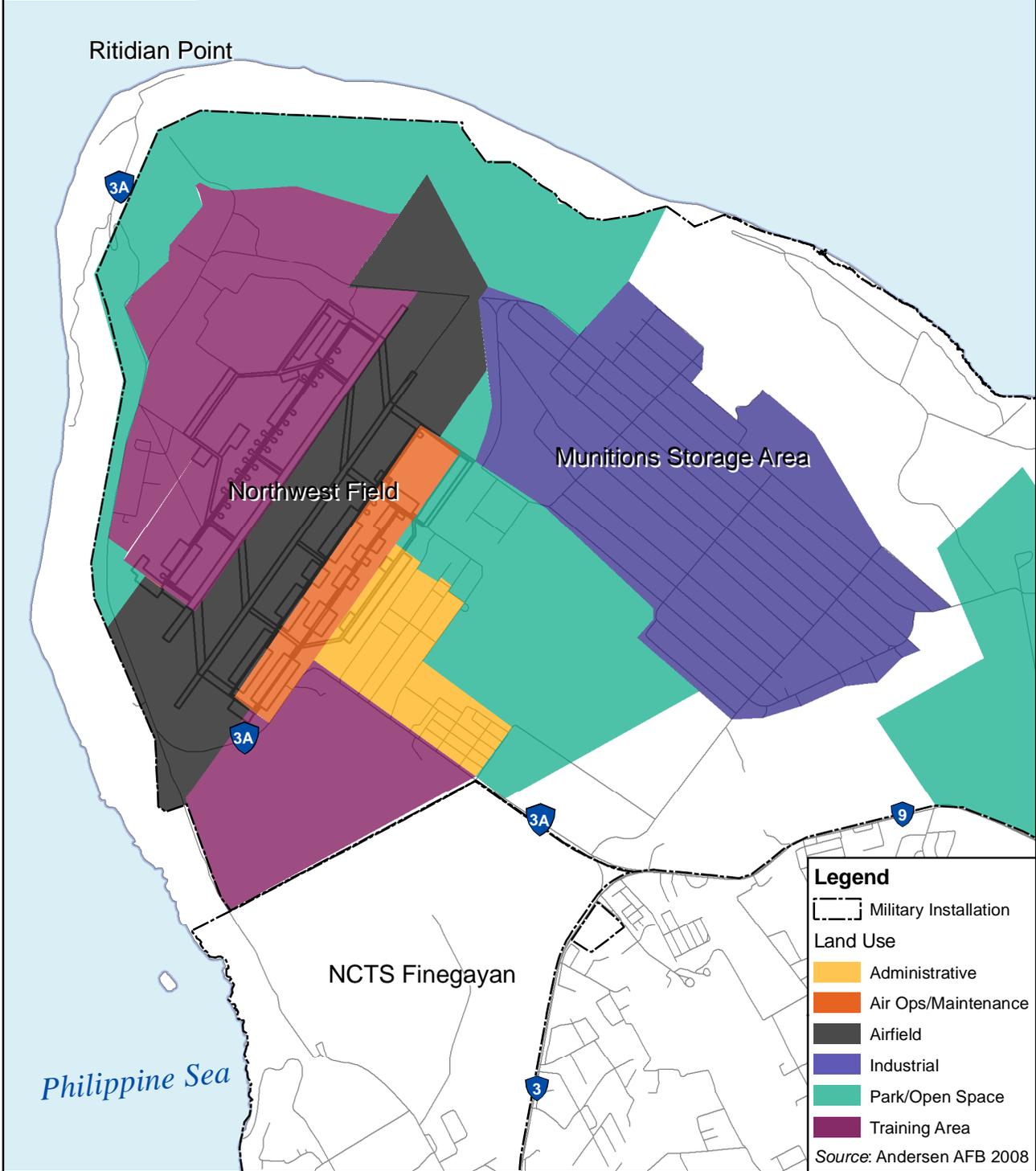
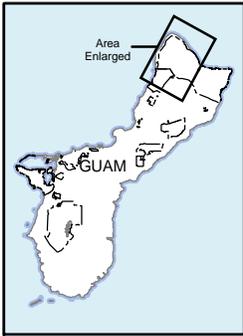
About 3,562 ac (1,442 ha) of NWF are the primary maneuver training areas available at Andersen AFB for field exercises and bivouacs. Routine training exercises include camp/tent setup, survival skills, land navigation, day/night tactical maneuvers and patrols, blank munitions and pyrotechnics firing, treatment and evaluation of casualties, fire safety, weapons security training, perimeter defense/security, field equipment training, and chemical attack/response.

There are non-DoD lands along the north and west coast of Andersen AFB. These public and private lands are bordered by Andersen AFB and the Philippine Sea (including Navy submerged lands) and are isolated from other non-federal lands. Access to the private area, including public access to Department of Interior lands, is through Andersen AFB land under an agreement between the landowners and the Air Force. The private lands are developed at very low-density levels, with few permanent buildings. The uses associate with these parcels include gardening, swimming, fishing, social and recreation gatherings and similar outdoor activities. Prior to the events of 9/11, the area supported an eco-tourism type day-use facility known as Star Sand Resort and are designated in the *North and Central Guam Land Use Plan* (Bureau of Statistics and Plans 2009) for Tourism/Resort; however, this designation is incompatible with the post 9/11 limited access available across military property. NCTS Finegayan, Route 9 and the residential areas of Yigo and Dededo are located south of Andersen AFB. The *North and Central Land Use Plan* (Bureau of Statistics and Plans 2009) designates this area south of Andersen AFB primarily as Very Low Density Residential, but there is a Village Center, a Commercial area, Residential and Park/Open Space identified (Figure 8.1-4) along the Andersen AFB boundary. The Park/Open Space is along the eastern coastline.

No prime farmlands were identified adjacent to Andersen AFB. Important farmlands were identified at discrete areas along the southern boundary of Andersen AFB (refer to Figure 8.1-3).

Andersen AFB Land Use Constraints on Community

Aircraft operations at the Main Base airfield generate an Accident Potential Zone (APZ) at either end of the runway that extends northeast into the ocean and southwest into civilian land areas. Approximately 718 ac (290 ha) of land to the southwest of Andersen AFB and south of Route 9, in the Village of Yigo, are within an APZ. The civilian affected area is primarily open space, natural conservation area, and low-to-moderate density residential development. Of the 718 ac (290 ha) of APZ outside Andersen AFB, 140 ac (57 ha) contain single family homes at a density of 2-4 ac (0.8-1.6 ha) per unit. The area lies on the approach to Runway 06 and is considered an incompatible land use within the APZ (PACAF 2006).



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**Figure 8.1-8
Northwest Field Land Use Plan**



Baseline noise level contours generated by the Andersen AFB airfield include airfield activities associated with the planned Air Force Intelligence Surveillance, Reconnaissance (ISR) and Strike Capability study. The DoD uses A-weighted (dBA) Day-Night Sound Level (DNL) noise levels for compatible land use planning around military air installations. Noise exposure levels are expressed as noise contours presented in five dBA DNL increments beginning at 60 or 65 DNL, depending on the installation, up to 85 dBA DNL. All noise contours are presented in Volume 2, Chapter 6, Noise.

In accordance with Navy Instructions (Office of the Chief of Naval Operations Instruction [OPNAVINST] 11010.36A), land use compatibility is assessed through estimating and overlaying different noise level contours on land use maps and categorizing land uses as compatible, compatible with restrictions, or incompatible with noise zones. Noise levels greater than or equal to 80 dBA are used to identify populations at most risk of hearing loss, unless noise attenuation features are provided (Secretary of Defense 2009). More detail on noise assessment methodology and the various guidance documents are provided in the Volume 2, Chapter 6, Noise.

The 80 dBA contour does not contain civilian land. The noise levels decrease with distance from the airfield as described in Volume 2, Chapter 6, Noise. The 70 dBA contour does extend into civilian land, and the land use is characterized by low density residential development and open space. Based on aerial photographs, it appears there are approximately 60 residential-like structures within the 70 dBA. No schools or hospitals were identified within the 70 dBA contour (Bureau of Statistics and Plans 2008). The planned designated land uses within the contour and the vicinity are Village Center, Park/Open Space, Agriculture and Very Low Density Residential (Bureau of Statistics and Plans 2009). The impact of the baseline 70 dBA noise contour on land use was addressed in the ISR Strike EIS (PACAF 2006). No mitigation was proposed.

Aviation training occurs at Northwest Field (NWF) generally involving multiple aircraft per training event. No schools or hospitals are adversely impacted by the noise but there are beach houses along the shore north of NWF that are periodically exposed to approximately 75 dBa (Volume 2, Chapter 6 Noise). Ground-based training at NWF includes detonations, but the noise generated would not extend beyond the Andersen AFB border. More information on training noise can be found in Volume 2, Chapter 6.

8.1.2.2 Finegayan

NCTS Finegayan, South Finegayan, and Potts Junction are non-contiguous DoD parcels (Figure 8.1-9). The Finegayan parcels are separated by the Former FAA parcel, and located on the northeast coast of Guam. The Philippine Sea and Navy submerged lands are to the west. The two parcels are approximately 2,700 ac (1,093 ha) in total area. Both are directly accessed from Route 3. NCTS Finegayan is used for military communications facilities, housing, and community support.

NCTS Finegayan

Approximately 355 ac (144 ha) are reserved at NCTS Finegayan for communication operations, as shown on Figure 8.1-9). These areas are essential for the NCTS mission, which is to provide continuous global and universal communications services to fleet units, shore activities, other federal agencies and joint forces. These reserved areas provide facilities for headquarters and command center communications activities.

In addition to being a communications site, the installation provides limited housing and community support functions. Historically, the installation supported a large population of military personnel and their families. Existing facilities include retail centers, a swimming pool, child care center, playing fields, a chapel, bachelor quarters, family housing, a fire station, and administration. The use of these facilities

has declined, and functions are being relocated to other DoD areas because the military population in the area does not support the continued maintenance and staffing of the facilities. Many of the facilities are underutilized and scheduled for demolition or mothballing if a suitable reuse is not identified. The 252 ac (102-ha) Haputo Ecological Reserve Area (ERA) is within NCTS Finegayan on the west coast.

Training activities at NCTS Finegayan include a rifle and pistol small arms range, urban warfare training in abandoned buildings, and a parachute drop zone. The small arms ranges generate a Surface Danger Zone (SDZ) extending into the submerged lands area (Figure 8.1-9). Haputo Beach is used for small craft landings and over-the-beach insertions.

Finegayan is bounded to the north by Andersen AFB land that is vacant (i.e., no modern manmade structures) and private, vacant land on the coastline. Route 3 and residential uses are located to the east.

Vacant (i.e., no modern manmade structures) former FAA lands are adjacent and south of NCTS Finegayan. The lands south are within the Dos Amantes Planning Area, for which the master plan was not adopted, but the area was designated in the plan as Tourist/Resort and Urban Center (GALC 2005) (see Figure 8.1-4). No prime or important farmlands were identified adjacent to the site (see Figure 8.1-3). An area of important farmlands was identified east of NCTS Finegayan and Route 3; however the *North and Central Guam Land Use Plan* (Bureau of Statistics and Plans 2009) does not designate Agriculture adjacent to Route 3. East of Route 3, the land is designated very low density residential and Village Center (see Figure 8.1-4).

South Finegayan

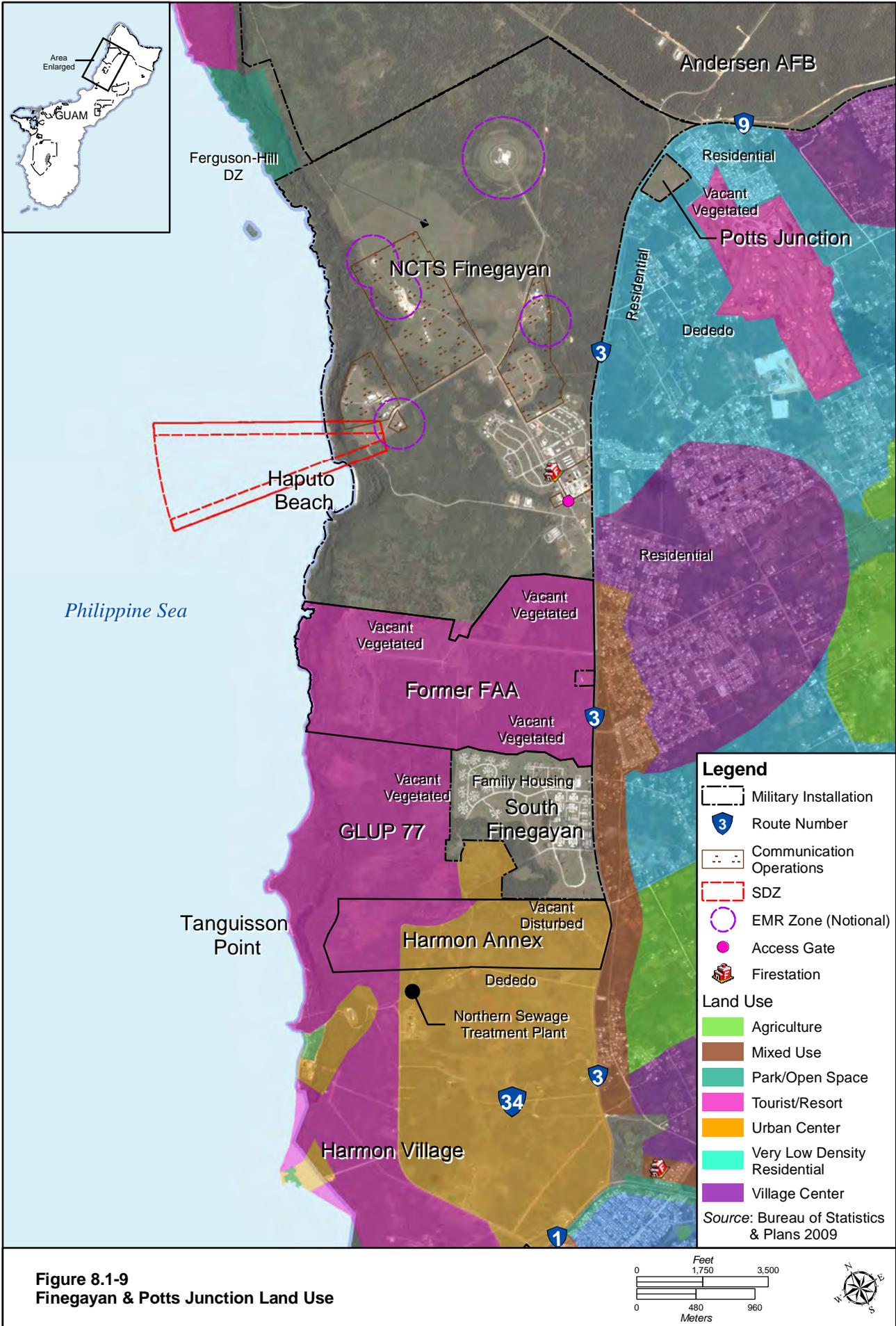
South Finegayan was, and is used only for Navy family housing. South Finegayan is bounded on the north by the former FAA land (see Figure 8.1-9).

Route 3 and residential communities are located to the east. GLUP 77 is located adjacent and to the west. Areas to the west and south appear vacant (i.e., no modern manmade structures) and naturally vegetated. In the *North and Central Guam Land Use Plan* (Bureau of Statistics and Plans 2009) areas west and south are within the Dos Amantes Planning Area (see Figure 8.1-4). Lands east of Route 3 are designated Mixed Use in the *North and Central Guam Land Use Plan* (Bureau of Statistics and Plans 2009). No prime farmlands are identified adjacent to the federal parcels. Important farmlands are designated south and west of South Finegayan. These important agricultural lands are not consistent with the Dos Amantes Master Plan, which designates the area for Hotel/Resort and Urban Center land uses.

Potts Junction

Potts Junction is an Air Force property located inland, east of Route 3 and NCTS Finegayan.

Access to the site is from Route 3. Historically, it was used for fuel storage, and the facilities have been removed from the site. The Air Force has not identified a future use for the site. The existing uses in the vicinity are residential. A vacant (i.e., no modern manmade structures) vegetated area is adjacent and southeast of the parcel. The adjacent and surrounding areas east of Route 3 are designated for residential land use.



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8.1.2.3 Non-DoD

Former FAA Parcel

The Former FAA parcel is on the northeast coast of Guam and is controlled by GALC (approximately 520 ac [210 ha]) and seven members of one family (160 ac [64 ha]) (JGPO 2008). Prior to release, it was used by FAA for housing; ground disturbance is evident as shown in the Guam Mapbook (Bureau of Statistics and Plans 2008). The parcel is located south of NCTS Finegayan and extends east to west between the Philippine Sea coastline and Route 3. Navy submerged lands are along the entire coastline. On the southern boundary is the GLUP 77 parcel (non-DoD) and Finegayan South (DoD). The *North and Central Guam Land Use Plan* (Bureau of Statistics and Plans 2009) shows the Former FAA parcel within the Dos Amantes Planning Area. Mixed Use is designated for future use along eastern edge of Route 3. There are no prime or important farmlands identified on the 1991 USDA map where the site is still described as federal land. South of the site and west of the South Finegayan parcel is an area designated as important farmlands; however, the Dos Amantes land uses are Hotel/Resort and Urban Center (see Figure 8.1-3).

There is a 4.5 ac (2 ha) Navy parcel on Route 3 that was retained by DoD. It is adjacent to the Former FAA area. It was the former site of the National Weather Service Station and is no longer used. There are remnant structures and utilities in the area. The land use designation east of Route 3 is Mixed Use.

GLUP 77

The GLUP 77 parcel was identified as surplus federal land under the Guam Excess Land Act of 1994 and is currently being processed for transfer from the federal government to GovGuam. All of the released parcels were addressed in the Guam Land Use Plan of 1977, but the particular GLUP 77 parcel referred to in this EIS/OEIS is former Navy land in the vicinity of NCTS Finegayan. Over the years, it has been commonly referred to as the GLUP 77 parcel. The parcel has South Finegayan (federal land) to the east and the Philippine Sea to the west. Navy submerged lands are along the entire coastline of the parcel. Areas to the north and south are non-DoD. The area is mostly forested (NAVFAC Pacific 2007) but some areas of disturbance are evident in the Guam Mapbook (Bureau of Statistics and Plans 2008). The *North and Central Guam Land Use Plan* (Bureau of Statistics and Plans 2009) designation is the Dos Amantes Planning Area (refer to Figure 8.1-4). GLUP 77 is located adjacent to DoD land boundaries and adjacent to non-DoD lands of interest. There are no prime farmlands identified at or adjacent GLUP 77, but there is an area of important farmlands on GLUP 77 and adjacent areas south (refer to Figure 8.1-3). As described above the Dos Amantes Plan area land uses are Hotel/Resort and Urban Center, not Agriculture.

Harmon

Harmon is non-DoD property that was released from federal land inventory as surplus federal lands under the Guam Excess Land Act 1994. It is located south of Navy GLUP 77 and Finegayan South, and was former Air Force land. The area of land being considered for acquisition or long-term leasing under the proposed action is less than the released Harmon lands; however, this EIS/OEIS refers to this parcel as the Harmon property. Route 3 and residential development are located to the east, and non-DoD land to the south and the west. The property of interest is located inland from the coastline. The land to the west and south of Harmon appears vacant (i.e., no modern manmade structures) and vegetated with some roadways as shown in the Guam Mapbook (2008). There are no prime farmlands identified at or adjacent to the Harmon area (see Figure 8.1-3), but the entire property is designated important farmlands.

The *North and Central Guam Land Use Plan* (Bureau of Statistics and Plans 2009) indicates the Harmon property is within the Dos Amantes Planning Area, with Hotel/Resort and Urban Center land use designations on the property (see Figure 8.1-4). The projected land use designations do not provide for agricultural uses. Mixed Use is designated along the eastern edge of Route 3 and further east there is an area designated for agricultural land use on important farmlands (see Figure 8.1-3).

8.1.2.1 Off Base Roadways

The proposed action includes on base roadway construction projects that would be implemented by DoD. An affected environment description for on base roadway construction projects is included beneath the appropriate subheadings in other sections of this chapter. The following section describes the affected environment for off base roadway construction projects that would be implemented by the Federal Highway Administration (FHWA). Volume 6 of this EIS/OEIS describes the impacts of the roadway projects.

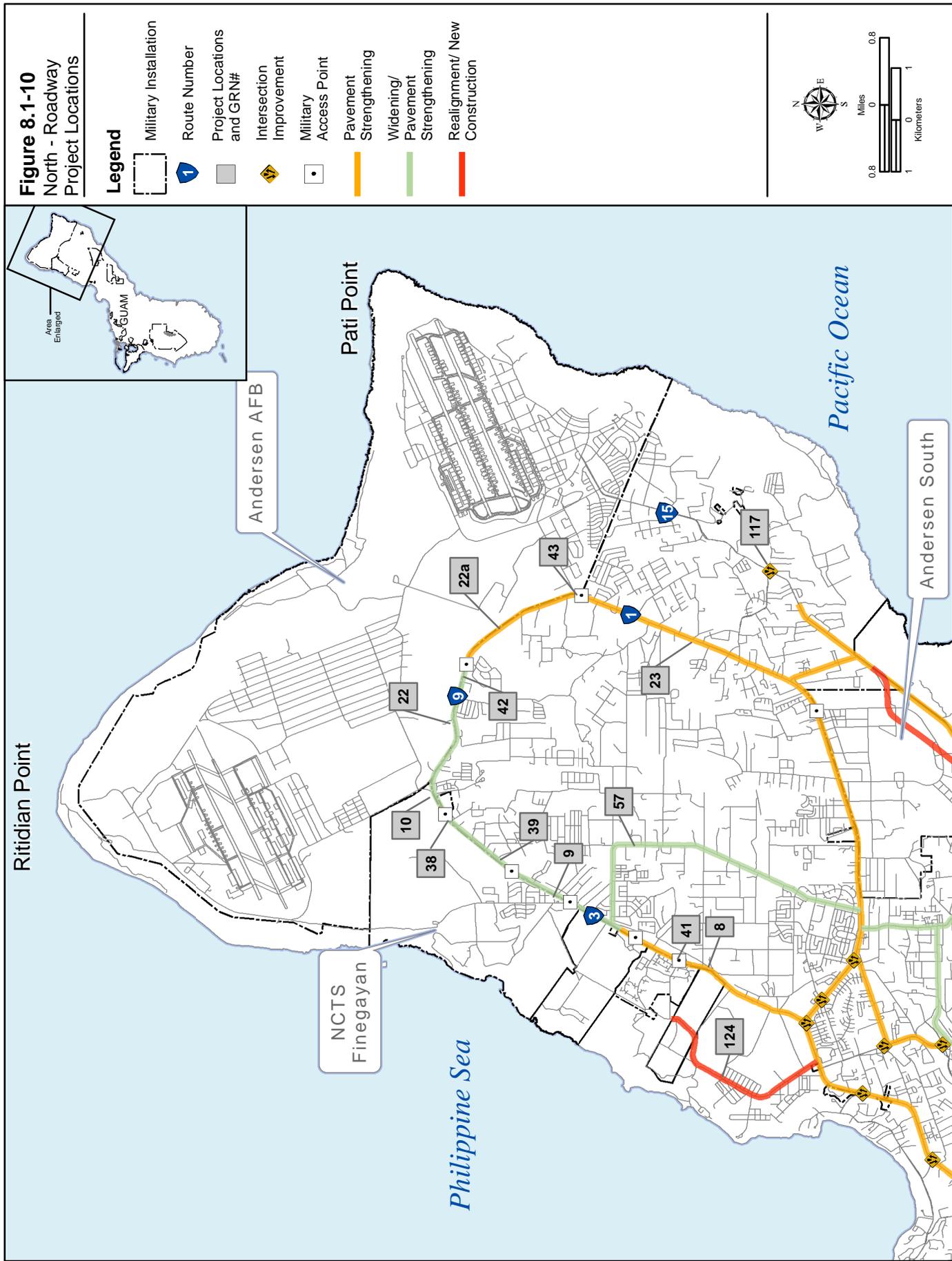
The proposed roadway improvement projects outside of the military lands and within the north region are located along existing Routes 1, 3, 9, 28, and 15, including a new road construction between Route 1 and Finegayan South, as summarized in Table 8.1-3. The locations of various proposed projects in the north region are shown in Figure 8.1-10.

Table 8.1-3. Proposed Guam Roadway Network (GRN) Projects in North Region

<i>Route</i>	<i>GRN#</i>	<i>Segment Limits</i>	<i>Pavement Strengthening</i>	<i>Intersection Improvements</i>	<i>Road Widening</i>	<i>New Road Construction</i>	<i>Military Access Point</i>
1	23	Chalan Lujuna to Route 9 (Andersen AFB)	X				
3	8	Route 28 to Route 1	X				
3	9	NCTS Finegayan to Route 28	X		X		
3	10	NCTS Finegayan to Route 9	X	X	X		
3	38	NCTS Finegayan (Commercial Gate)					MAP 2
3	38A	NCTS Finegayan (Commercial Gate)					MAP 2
3	39	NCTS Finegayan (Main Gate)					MAP 3
3	39A	NCTS Finegayan (Main Gate)					MAP 3
3	41	South Finegayan (Residential Gate)					MAP 5
3	41A	South Finegayan (Residential Gate)					MAP 5
9	22	Route 3 to Andersen AFB (North Gate)	X		X		
9	22a	Andersen AFB North Gate to Route 1 (Andersen AFB Main Gate)	X				
9	42	Andersen AFB (North Gate)					MAP 6
28	57	Route 1 to Route 3	X	X	X		
15	117	Route 15/29 Intersection	X				
Finegayan Connection	124	Route 1/16 Intersection to South Finegayan		X		X	

Legend: MAP= Military Access Point.

Note: Alternative 1 include all projects except #38, 39, and 41; Alternative 2 include all projects except #38A, 39A, and 41A; Alternative 3 include all projects except #38, 39A, 41A, and 124; Alternative 1 include all projects except #38, 39, and 41



Route 1, also called Marine Corps Drive, is a Trunk Highway that connects major population centers and traffic generators. Route 1 in the North Region is part of a loop road that connects to Routes 3 and 9; Routes 3 and 9 are classified as Minor Highways. Guam Road Network (GRN) #23 is the only roadway improvement project proposed along this segment of Route 1. Land uses adjacent to GRN #23 include urban residential and some commercial use in the southern portion, and agricultural/non-urban residential and DoD land in the northern portion. Vacant land is also found throughout the alignment. Various community facilities, including churches and schools and recreation facilities are found at the southern portion of the alignment. Guam Animals in Need and GovGuam facilities (Guam Power Authority [GPA] and a bus depot) are also located adjacent to the alignment in the southern portion. Land use designations within the project area, as shown in the North and Central Guam Land Use Plan, include park/open space, village center, industrial, and residential adjacent to the project area. No ocean uses are within the vicinity of Route 1 in the North Region.

Route 3 is part of a loop road connecting to Routes 1 and 9. Roadway improvement projects would involve pavement strengthening (GRN #8, 9, and 10), road widening (GRN #9 and 10), and MAP road projects (GRN# 38, 39, and 41). Land uses adjacent to these project areas are agricultural/non-urban residential and DoD lands (at South Finegayan and NCTS Finegayan). Large swaths of vacant land are located throughout the alignment. Main activity centers include South Finegayan, NCTS Finegayan, Ukudu High School, Finegayan Elementary School, and Alte Guam Golf Resort. The Potts Tank Farm is located at the northern end of GRN #9. Based on the *North and Central Guam Land Use Plan*, land uses along GRN #8, 41, and 9 on Route 3 are designated mixed use. In addition, land uses in the vicinity of GRN #39 are designated as village center and residential uses. No ocean uses are within the vicinity of Route 3.

Route 9 connects Routes 3 and 1 of the loop road. Two pavement strengthening projects (GRN #22 and 22a) and a MAP project (GRN #42) are proposed on Route 9. Land uses adjacent to these projects include DoD land (Andersen AFB) to the north, and agricultural/non-urban residential and some urban residential. Machanao Elementary School is located near GRN #42. Large swaths of vacant land are adjacent to the projects, including DoD and non-DoD lands. A sanitary landfill is located on DoD land north of GRN #22a. According to the *North and Central Guam Land Use Plan*, land uses in the vicinity of GRN #22a are designated as village center, residential, and park/open space. No ocean uses are within the vicinity of Route 9.

Route 28 is an east-west road connecting Routes 3 and 1 of the loop road. Road widening from two to four lanes, intersection improvement, and pavement strengthening is proposed for this segment of Route 28 (GRN #57). Land uses adjacent to the project include urban residential, agricultural/non-urban residential, and vacant land. The Dededo Quarry and Guam International Country Club and Golf Course are located near the southern end of the project. According to the *North and Central Guam Land Use Plan*, land uses within this area are designated as village center, residential, mixed use, and park/open space (Figure 8.1-4). No ocean uses are within the vicinity of Route 28. An intersection improvement is proposed at the Route 15/29 intersection. Route 15 is a major highway that runs north-south along the east coast of the island. This section of Route 15 connects Andersen AFB and Andersen South. Land use in the vicinity of the proposed intersection improvement is residential.

A new four-lane parallel road (GRN #124) is proposed between the intersection of Route 1 and 16 and South Finegayan to alleviate traffic on Routes 1 and 3, and the intersection of Routes 1 and 3. This new parallel road, called the Finegayan Connection, would provide alternative access for Route 16 traffic at Route 27. In addition, an intersection improvement at Routes 1 and 16 is also proposed. Land use in the

vicinity of this proposed parallel road is mixed use, with a large shopping center (i.e., Micronesia Mall) located near the intersection of Routes 1 and 16 and vacant land mixed with residential area (i.e., Dededo Community) along the segment of Route 3 between Route 1 and the Navy South Finegayan, which is DoD land. According to the *North and Central Guam Land Use Plan*, this area is part of the Dos Amantes Planning Area, where hotel/resort and urban center would be the major use of land (refer to Figure 8.1-4).

8.1.3 Central

The same references relied upon for the north area land use discussions apply to central Guam. This section introduces the land uses in the vicinity of the proposed roadway projects in the Central region. The roadway projects are described so as to limit the amount of affected environment addressed. Volume 6 of this EIS/OEIS describes the impacts of the roadway projects.

8.1.3.1 Andersen South

Andersen South is an Air Force property that encompasses approximately 2,060 ac (834 ha). The property is located inland of the Pacific Ocean coast (Figure 8.1-11) and west of Route 15. It is located south of Route 1, except for a small parcel (approximately 29 ac [12 ha]) that is the former site of the Yigo War Dog Cemetery. The dog remains have been relocated, but the area is still referred to as the Yigo War Dog Cemetery parcel. There is a water pump station on the site. Most of the site is vacant (i.e., no modern manmade structures) and naturally vegetated (Bureau of Statistics and Plans 2008).

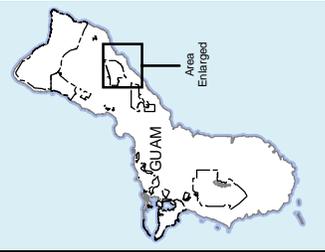
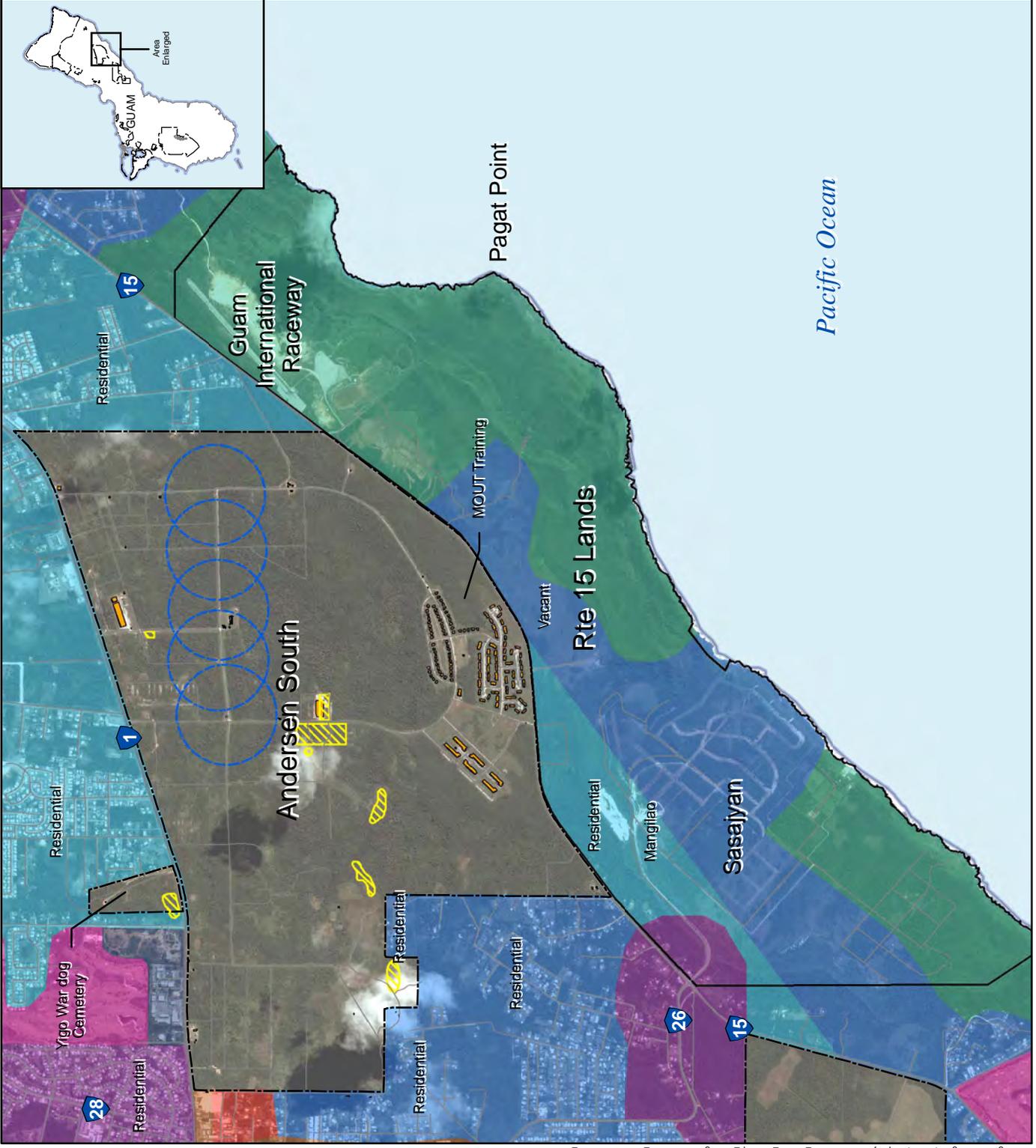
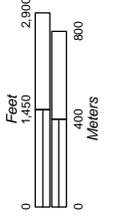
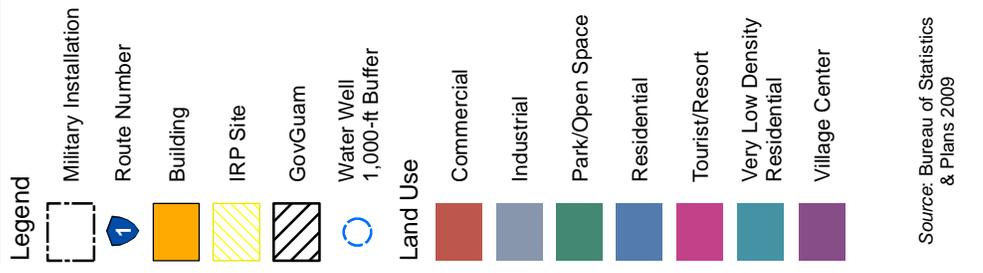
The Andersen South area, located south of Route 1, consists of open fields, wooded areas, and vacant houses that have been used for humanitarian operations, staging, bivouac, equipment inspection, and small unit tactics. The most intensive use at Andersen South currently occurs during exercises involving up to three Marine Corps companies utilizing Andersen South range for up to three weeks, which currently occurs twice a year. Blanks used in this training produce an estimated noise level of about 96 dBA at a distance of 500 ft (152 m) and about 90 dBA at a distance of 1,000 ft (305 m). Military Operations in Urban Terrain (MOUT) training is conducted in abandoned housing areas. There are installation restoration (clean-up) sites and water production wells with wellhead clearance buffers in the area. Historically, the site was used for family housing and barracks, and includes a wastewater pump station, water booster pump station, water tanks and electrical substation that are not currently being used.

Andersen South includes an 80 ac (32 ha) parcel located in the northeastern area of the site that was deeded in 1992 from DoD to GovGuam for development of a Guam Public School System High School. There are conditions on the 30-year quit claim deed that limit the use to educational facilities and require no impact on the water lens or water wells in the vicinity. If conditions are not met, the land could revert back to the federal government (U.S. and GovGuam 1992). The school was never developed.

Historically, portions of the site were leased to civilians for crop production and one 10-acre lease is currently under lease in the western area of the property (Andersen AFB 2009). The lease can be terminated at Air Force discretion when a military use for the area is identified. There are no designated prime or important farmlands on Andersen South.

Residential development lies to the east, north and west of Andersen South, but not adjacent. Some of these residential areas appear to be low density (Bureau of Statistics and Plans 2008). The land use plan designation adjacent to the parcel is predominantly Very Low Density Residential (to the east and north) and Residential (to the southwest). Areas east of Route 15 are designated Very Low Density Residential and Residential with a small area of Park/Open Space in the *North and Central Guam Land Use Plan* (Bureau of Statistics and Plans 2009). The adjacent areas to the northwest are designated for Commercial,

Figure 8.1-11
Andersen South
Land Use



Village Center and Industrial land uses in the *North and Central Guam Land Use Plan* (Bureau of Figure Statistics and Plans 2009) (refer to Figure 8.1-4). No prime farmlands were identified adjacent to the site, but there are important farmlands adjacent to the southern point of the parcel and east of Route 15. The *North and Central Guam Land Use Plan* (Bureau of Statistics and Plans 2009) does not designate Agriculture land uses in the important farmlands area.

8.1.3.2 Barrigada

The Barrigada parcels are adjacent to each other and inland from the Pacific Ocean coast. Navy Barrigada is approximately 1,420 ac (575 ha). Its primary use is as a NCTS high frequency transmitter station. There is a large antenna field developed around an active transmitter facility. The areas reserved for communications operations are shown on Figure 8.1-12. The transmitters generate an electromagnetic radiation (EMR) arc. A DoD EMR and radio frequency study is in progress that would determine the required stand-off distances for future development (NAVFAC Pacific 2009). There is a Fleet Hospital warehouse and Army tenants at Barrigada, including Guam Army National Guard (GUARNG) (Figure 8.1-12). GUARNG has facilities in the northwest area near the site entrance off Route 8. They have requested additional land from the Navy for an expansion. An Army Reserve Battalion headquarters building is adjacent to the Guam Army National Guard facilities.

There are abandoned family housing units available for urban warfare training (refer to Figure 8.1-12). Open areas (former transmitter sites) provide command and control, and logistics training; bivouac, vehicle land navigation, and convoy training; and other field activities (Navy 2009).

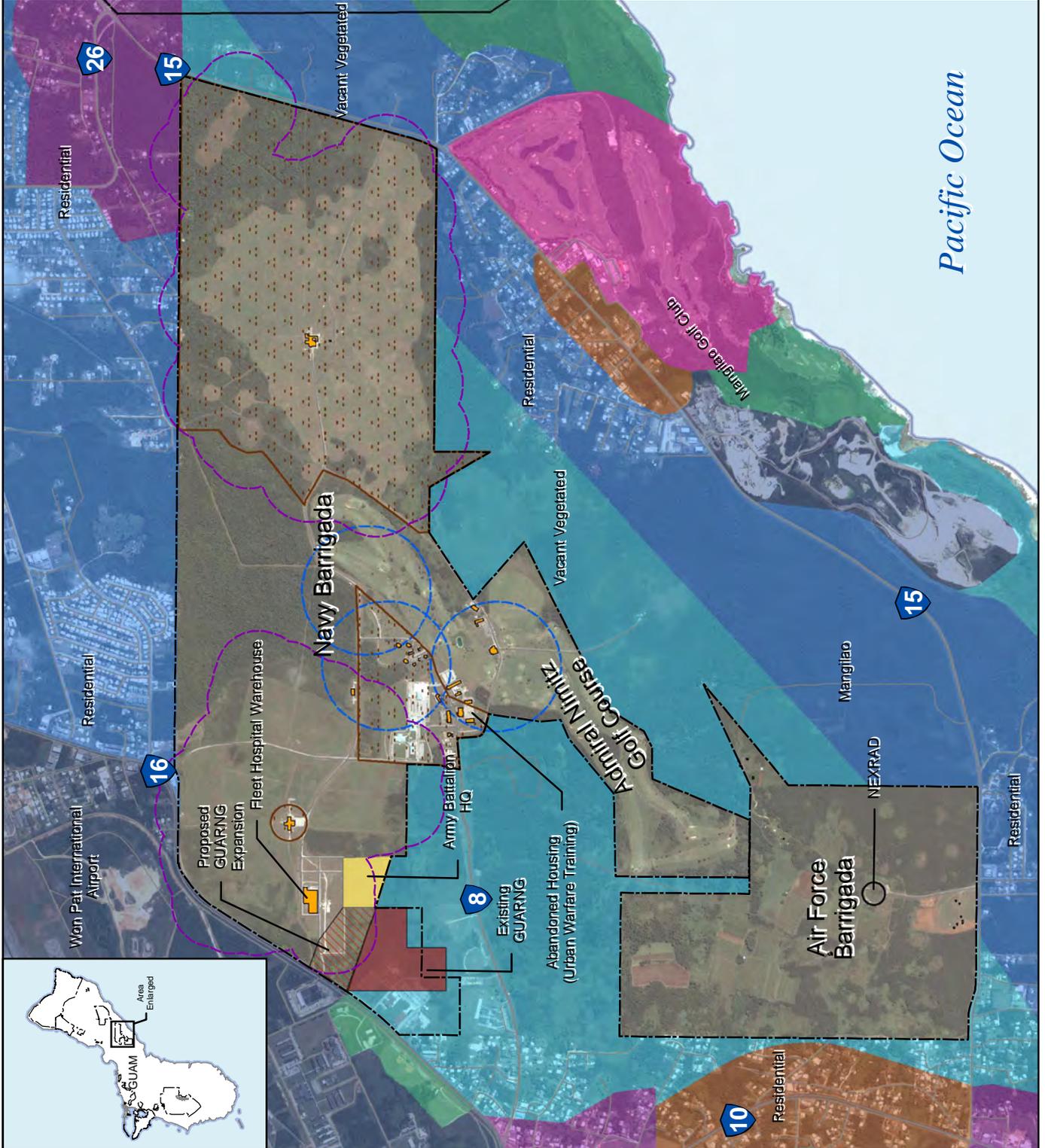
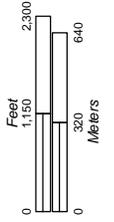
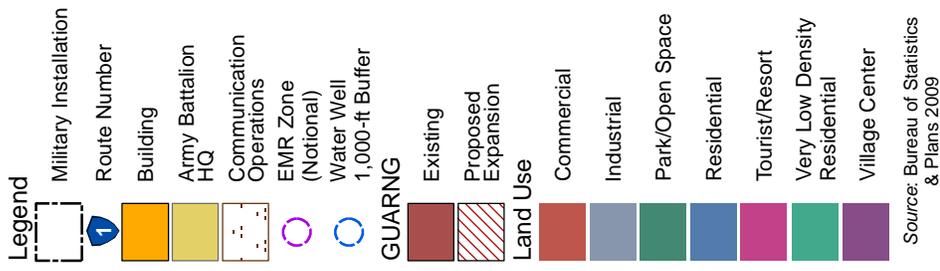
In addition to EMR arcs, there are water wells with clearance zones and installation restoration (clean-up) sites that have been identified. The Navy Golf Course connects the Navy operational area and Air Force Barrigada. Air Force Barrigada is approximately 432 ac (175 ha). The parcel has a Next Generations Radar weather antenna in the center. The Next Generations Radar facility would remain at the site, but it does not preclude development of the remainder of the site.

The Barrigada parcels are generally bordered by residential neighborhoods and vacant (i.e., no modern manmade structures) land. Guam International Airport (i.e., A.B. Won Pat International Airport) is northwest, but not adjacent to Navy Barrigada. The *North and Central Guam Land Use Plan* (Bureau of Statistics and Plans 2009) designation for the adjacent surrounding land is Very Low Density Residential or Residential, except for an area of Commercial use at the northwest corner of Navy Barrigada and a small area of Village Center at the northeast. No prime farmlands were identified adjacent to the site, but important farmlands were designated east of Air Force Barrigada and adjacent to the eastern portion of Navy Barrigada to the north and south. The *North and Central Guam Land Use Plan* (Bureau of Statistics and Plans 2009) does not designate Agriculture land uses in the important farmlands area.

8.1.3.3 Non-DoD Land

There are approximately 1,129 ac (457 ha) of non-DoD lands that are of interest located southeast of Andersen South and Route 15. GovGuam submerged lands border the eastern edge of property. The coast is characterized by a steep undeveloped cliff and access is difficult. There are multiple private landowners with possible ancestral lands claims as well as GovGuam parcels. Historically, portions of the property closest to Route 15 were federal lands and remnant roadways are evident in the Guam Mapbook (Bureau of Statistics and Plans 2008). The majority of the site appears to be naturally vegetated but there are individual residences and the Guam International Raceway (see Figure 8.1-11) located within the northern

Figure 8.1-12
Navy and Air Force
Barrigada Land Use



part of the Route 15 property. There are natural and cultural resources that provide recreational and educational opportunities for the public.

The *North and Central Guam Land Use Plan* (Bureau of Statistics and Plans 2009) designation for the area is Residential, Very Low residential and Park/Open Space (see Figure 8.1-4). No prime farmlands were identified at the site, but there are areas of important farmlands (refer to Figure 8.1-3). *North and Central Guam Land Use Plan* (Bureau of Statistics and Plans 2009) does not designate Agriculture land use in the important farmlands area.

8.1.3.4 Off Base Roadways

The proposed roadway improvement projects within the central region are located along existing Routes 1, 8, 8A 10, 15, 16, 25, 26, and 27, and Chalan Lujuna Road, as summarized in Table 8.1-4. The location of various proposed projects in the central region is shown in Figure 8.1-13.

Table 8.1-4. Proposed GRN Projects in Central Region

<i>Route</i>	<i>GRN#</i>	<i>Segment Limits</i>	<i>Pavement Strengthening</i>	<i>Intersection Improvements</i>	<i>Road Widening</i>	<i>Road Realignment</i>	<i>Bridge Replacement</i>	<i>Military Access Point</i>
1	1	Route 1/8 Intersection		X				
1	2	Route 1/3 Intersection		X				
1	3	East of Route 4 (Agana Bridge)					X	
1	6	Route 27 to Chalan Lujuna	X	X				
1	7	Route 3 to Route 27	X	X				
1	13	Route 11 to Asan River	X					
1	14	Asan River to Route 6 (Adelup)	X					
1	15	Route 6 (Adelup) to Route 4	X					
1	33	Route 8 to Route 3	X	X				
1	35	Atantano, Laguas, Sasa, Fonte Bridges					X	
1	44	Anderson South (Main Gate)						MAP 8
7	113	Route 7/7A		X				
8	16	Tiyan Parkway/Route 33 (east) to Route 1	X		X			
8	17	Route 10 to Tiyan Parkway/Route 33 (east)	X	X	X			
8A	31	Route 16 to Naval Communication Area Master Station (NAVCAMS) Barrigada	X					
8A	48	Barrigada (Navy)						MAP 12
8A	74	Route 16 to NAVCAMS Barrigada	X		X			
10	30	Route 15 to Routes 8 and 16	X					
15	12	Smith Quarry to Chalan Lujuna	X					
15	32	Route 10 to Connector (Chalan Lujuna end)	X	X				
15	36	Route 15 Realignment				X		
15	46	Andersen South (Secondary Gate)						MAP 10
15	49	Barrigada (Air Force)						MAP 13
15	49A	Barrigada (Air Force)						MAP 13A
16	18	Route 27 to Route 10A	X					
16	19	Route 10A to Sabana Barrigada Drive	X	X				
16	20	Sabana Barrigada Drive to Route 8/10	X					

Route	GRN#	Segment Limits	Pavement Strengthening	Intersection Improvements	Road Widening	Road Realignment	Bridge Replacement	Military Access Point
16	47	Barrigada (Navy)						MAP 11
16	63	Route 10A to Sabana Barrigada Drive	X		X			
25	29	Route 16 to Route 26	X		X			
26	28	Route 1 to Route 15	X	X	X			
27	21	Route 1 to Route 16	X					
Chalan Lujuna	11	Route 1 to Route 15	X	X				

Notes: Projects for Alternatives 1 and 2 include all projects listed above, except GRN #63, 74, 47, 48, 49, and 49A.

Projects for Alternative 3 include all projects listed above, except GRN #20, 31, and 49A.

Projects for Alternative 8 include all projects listed above, except GRN #63, 74, 47, 48, and 49.

Projects along Route 1, running from south to north, include GRN #13, 14, 15, 3, 1, 33, 2, 7, 6, 44, and 35. Land use along Route 1 within the central region can be best described in three segments. Segment 1 is the arterial roadway that runs along the west coast of the island, passing through the municipalities of Piti, Asan, and east Hagatna. Pavement strengthening projects are proposed along this segment (GRN #13, 14, and 15). Land uses to the north of these projects are primarily beaches and parkland. South of the project, land uses are primarily agricultural/non-urban residential. Commercial uses are concentrated in the Hagatna portion of the project area. GRN #15 is adjacent to the Governor's Complex, the Gregorio Perez Marina, and Paseo de Susana Park. GRN #3 and 1 involve intersection improvements and are located on Route 1 at the intersections of Routes 4 and 8, respectively.

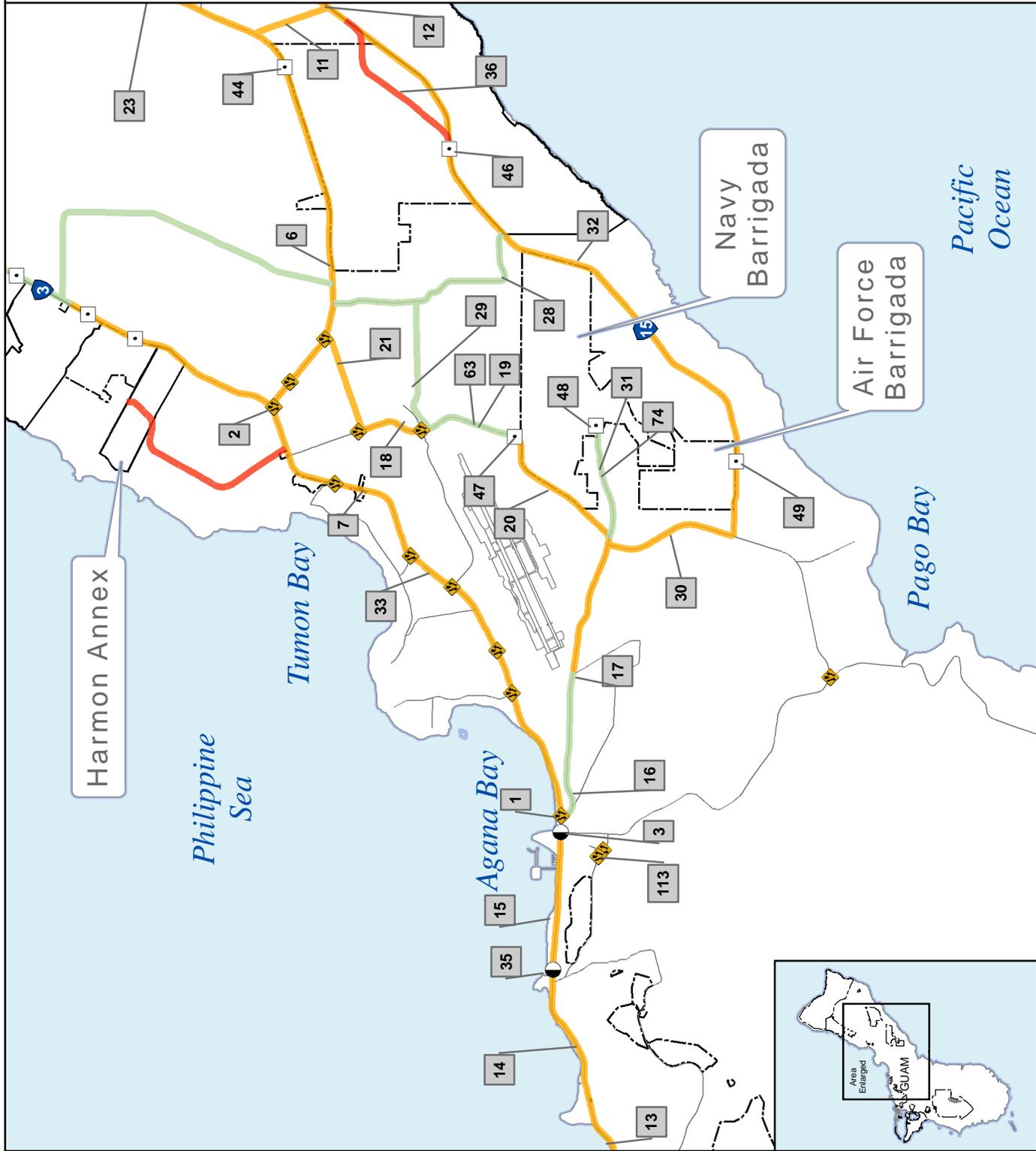
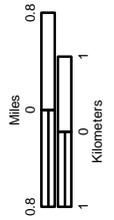
Land uses adjacent to these projects are commercial and recreation, including the Paseo de Susana Park and Padre Palomo Park. Segment 2 of Route 1 includes GRN #33, which involves pavement strengthening and intersection improvement, located on Route 1 from the intersection of Routes 8 and 16. This segment of the proposed improvement runs parallel to Agana Bay and then cuts inland through Tamuning north to the Dededo communities. Land uses in Hagatna are primarily commercial to the south and beach/parkland to the north. In Tamuning and Dededo, the primary land uses are commercial and industrial, with some adjacent urban residential. Several schools, large office buildings, hotels, and other commercial uses are found along the project corridor. Harmon Industrial Park and the Tumon Tank Field are located near the northern end of GRN #33. Segment 3 of Route 1 includes pavement strengthening projects (GRN #6 and 7), an intersection improvement project (GRN #2, 6, and 7), and a MAP project (GRN #44). Land uses adjacent to this segment are primarily urban residential to the north, agricultural/non-urban residential, and DoD land (Andersen South) to the south.

Route 8 is a major highway that runs in the east-west direction, connecting Route 1 on the west coast and Barrigada Navy Base and Route 15 on the east coast of the island. Proposed improvements on Route 8 include pavement strengthening projects (GRN #16, 17, 31, and 74) and a MAP at the Barrigada Navy Base (GRN #48). Road widening from four to six lanes is also proposed for GRN #16 and 17, and widening to provide a median is proposed for GRN #74. Primary land uses along Route 8 are commercial and residential mixed use at the area near the Route 1 intersection where roadway widening (GRN #16) is proposed. The Guam International Airport is situated along the north side of Route 8 where GRN #17 is proposed. Land along Route 8 where GRN #31 and 74 are proposed is vacant, but it is designated for residential use. Federal land (i.e., Barrigada Navy Base) is located at the end of Route 8. No ocean uses are within the vicinity of Route 8.

Figure 8.1-13
 Central - Roadway
 Project Locations

Legend

- Military Installation
- Route Number
- Project Locations and GRN#
- Bridge Replacement
- Intersection Improvement
- Military Access Point
- Pavement Strengthening
- Widening/Pavement Strengthening
- Realignment/ New Construction



Route 16 runs north and south, connecting Routes 8 and 1. Proposed improvements on Route 16 include pavement strengthening projects (GRN #18, 19, 20, and 63) and a MAP at the Barrigada Navy Base (GRN #47). Intersection improvements along GRN #18 and 19 would also be undertaken. Road widening from four to six lanes is also proposed for GRN #63. Primary land uses along Route 16 are low-density residential on the southern portion and commercial/industrial on the north part of the route. No ocean uses are within the vicinity of Route 16.

Routes 25, 26, and 27 are two-lane roadways that connect Routes 1 and 16. Pavement strengthening is proposed for all of these routes (GRN #29, 28, and 21). In addition, road widening from two to four lanes is proposed along Route 25 (GRN #29) and Route 26 (GRN #28). Primary land uses along Routes 25, 26, and 27 are low-density residential. No ocean uses are within the vicinity of Routes 25 and 26.

Route 10 runs north and south, connecting Routes 4, 18, and 8. A pavement strengthening project (GRN #30) is proposed on Route 10 between the Route 8 and 15 intersections. No ocean uses are within the vicinity of Route 10.

Route 15 is a main roadway running along the east coast (Pacific Ocean) of the island, connecting Route 10 from the south to Route 1 near the Andersen AFB gate. A pavement strengthening project (GRN #32) and three MAP projects (GRN #46, 49 and 49A) are proposed along this roadway. At the area south of Andersen South, Route 15 would be realigned onto the DoD land (GRN #36) to allow construction of the Firing Range that will be located east of the existing Route 15. Besides the DoD lands, primary land uses along Route 15 are residential and low-density residential. Tourist/resort uses, as well as agriculture, are located along the coastline off Route 15. No ocean uses are within the vicinity of Route 15.

The last roadway improvement project (GRN #11) within the Central Region is located along Chalan Lujuna Road, which connects Route 15 to Route 1 east of Andersen South. This project includes pavement strengthening and intersection improvements. Primary land uses along this roadway are residential and low-density residential. No ocean uses are within the vicinity of Chalan Lujuna.

8.1.4 Apra Harbor

Data sources relied upon for the north and central land use discussions are relevant to the Apra Harbor land use analysis, except the *North and Central Guam Land Use Plan* (Bureau of Statistics and Plans 2009) because it does not include Apra Harbor and areas south. The 1966 and the upadopted *I Tano'-Ta* (Territorial Planning Council 1994) land use plans were used to assess the trend in land use planning for areas adjacent to Naval Base Guam. Naval Base Guam at Apra Harbor covers approximately 6,200 ac (2,509 ha) and is located on the southwest coast of Guam. Operational facilities are primarily located at the waterfront. The base serves as the forward deployment and logistics hub for sea, land, and air forces operating in Asia and the Western Pacific. Naval Base Guam features multiple land uses with logistics and fleet support being the focus of operational activities. Access via water is from Outer Apra Harbor. Land access to the Naval Base Guam is directly from Marine Corps Drive and Route 2. Other Navy operational areas are accessed via secondary roads from Marine Corps Drive at intersections located north of the Naval Base Guam access. These other areas include Polaris Point, Drydock Island, and Glass Breakwater.

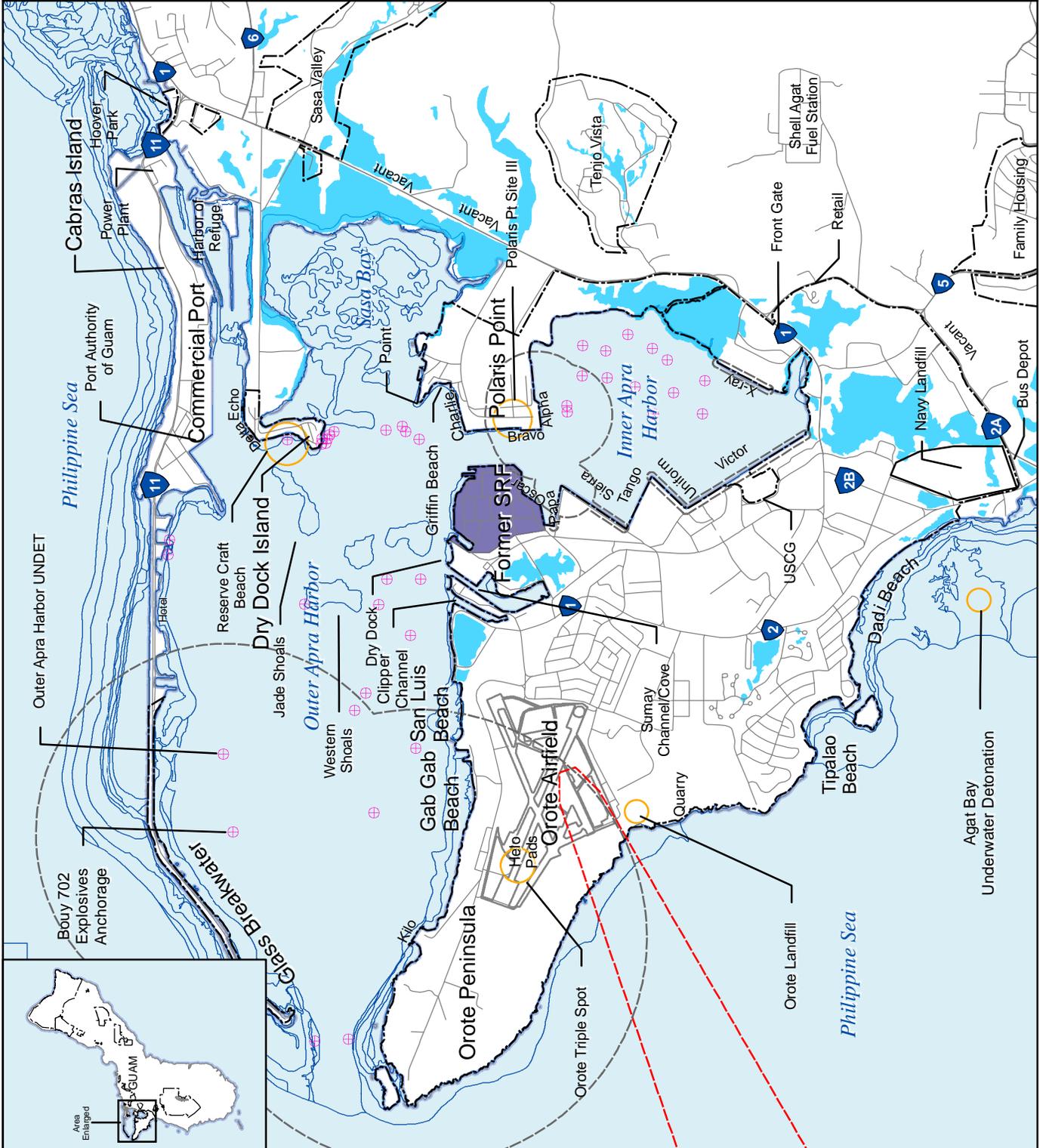
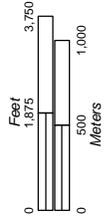
8.1.4.1 Harbor

Apra Harbor is the only deep draft harbor on Guam. The harbor is divided into Outer Apra Harbor and Inner Apra Harbor. Inner Apra Harbor is located south of Outer Apra Harbor (Figure 8.1-14). All ship traffic to and from the harbor uses the single entrance channel located at the western end of Outer Apra

Figure 8.1-14
Naval Base Guam
Land Use

Legend	
	Military Installation
	Route Number
	GEDA Lease Area
	Wetland
	SDZ
	Reef
	Mooring Buoy
	Existing IBD
	ESQD Arc
	Training Sites

Source: COMNAV Marianas 2001



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Harbor. Access to Inner Apra Harbor is through a single channel from Outer Apra Harbor. Inner Apra Harbor is controlled by Commander Navy Region (COMNAV) Marianas and is restricted to military use, including ships from allied nations. Outer Apra Harbor is controlled by the Commander USCG Marianas Section and is shared by a wide variety of ships: commercial, military and recreational.

Land/Submerged Land Ownership and Management

The Navy controls and manages the majority of Apra Harbor submerged lands, except for a portion fronting Port Authority of Guam (PAG) facilities in the northeast corner of Outer Apra Harbor (as described in Section 8.1.2). The Navy property bordering the Harbor includes Orote Peninsula, Inner Apra Harbor, Dry Dock Island, and Glass Breakwater (refer to Figure 8.1-14). There is an exception at Victor Wharf in Inner Apra Harbor where the USCG controls a portion as shown on Figure 8.1-14. Sasa Bay Marine Preserve was designated by GovGuam, but is not acknowledged by the Navy because it was established within Navy submerged lands.

The Navy leases the Former Ship Repair Facility (SRF) area, located on the western side of the Inner Apra Harbor Channel, to the Guam Economic Development and Commerce Authority (GEDCA) who subleases it to Guam Shipyard. It is referred to as Former SRF because the Navy ship repair facility historically operated in the same area. The Former SRF area is not used efficiently and the Guam Shipyard does not require the entire leased area. There are numerous deteriorating buildings pending demolition. The current lease term expires in 2012. Future use of the SRF lands beyond 2012 is currently being reviewed by the Navy. The lease area is surrounded by Navy land/submerged land uses. Commanding Officer USCG is the Captain of the Port and controls Outer Apra Harbor. Navy Security zones extend outward from the Navy controlled waterfront and related military anchorages/moorings. Navy ship traffic and wharf assignments are managed by Navy Port Operations. The PAG serves a similar function for commercial vessels. Commercial vessels dock at the PAG's Commercial Port. Both entities track shipping traffic. The USCG has multiple missions, including port and waterways security and maritime safety. All watercraft, including recreational boats, are subject to federal rules and regulations that are enforced by the USCG.

For public health, security and anti-terrorism force protection reasons, the Navy imposes restrictions on non-DoD operations and establishes standoff distances from Navy facilities and ships, including Navy anchorages and buoys in Outer Apra Harbor. The arrival and departure of large vessels, such as an aircraft carrier, temporarily restricts ship traffic in Outer Apra Harbor.

Training- Land and Submerged Land

There are numerous training areas/facilities at Naval Base Guam as follows and shown on Figure 8.1-14 (Navy 2009):

- Inner Apra Harbor: military diving, logistics training, small boat activities, security activities, drop zones, and torpedo/target recovery training
- Gab Gab Beach: military and recreational activities. The western half of Gab Gab Beach is primarily used to support EOD and Naval Special Warfare training requirements. Activities include military diving, logistics training, small boat activities, security activities, drop zones, and anti-terrorism/force protection (AT/FP).
- Dry Dock Island: Reserve Craft Beach is a small beach area located on the western shoreline of Dry Dock Island. It supports both military and recreational activities. It is used as an offload area for amphibious landing craft, as well as for EOD inert training activities, military diving, logistics training, small boat activities, and security activities.

- Sumay Channel/Cove: recreational boat marina and an EOD small boat facility. It is used for insertion/extraction training for Naval Special Warfare and amphibious vehicle ramp activity, military diving, logistics training, small boat activities, and security activities.
- Clipper Channel provides insertion/extraction training for Naval Special Warfare, military diving, logistics training, small boat activities, security activities, and AT/FP. The Clipper Channel has the potential to support amphibious vehicle ramp activity.
- San Luis Beach is used for both military and recreational activities. San Luis Beach is used to support EOD and Naval Special Warfare training requirements. Activities include military diving, logistics training, small boat activities, security activities, and drop zones.
- Outer Apra Harbor supports frequent and varied training requirements for Navy Sea, Air, Land Forces, EOD, and Marine Support Squadrons including underwater detonations (explosive charges up to 10 to 20 pounds Net Explosive Weight (NEW) pending agency consultation are permitted at a site near Buoy 702), military diving, logistics training, small boat activities, security activities, drop zones, visit board search and seizures, and amphibious craft navigation.
- Kilo Wharf is used for munitions handling and is a training site with limited capabilities due to explosive safety constraints; however, when explosive constraints are reduced it is used for AT/FP training and Visit Board Search and Seizure activities.
- Polaris Point Field supports both military and recreational activities and beach access to small landing craft. Polaris Point Field supports landing zones (LZs), small field training exercises, temporary bivouac, craft laydown, parachute insertions (freefall), assault training activities, and EOD and Special Forces Training.
- Polaris Point Beach supports both military and recreational activities and beach access to small landing craft and Landing Craft Air Cushion. Polaris Point Beach supports military diving, logistics training, small boat activities, security activities, and drop zones.
- Polaris Point Site III is where Guam-homeported submarines and the submarine tender are located and is the primary site location for docking, training, and support infrastructure. Additionally, it supports torpedo/target logistics training.
- Orote Point Airfield consists of expeditionary runways and taxiways and is largely encumbered by the ESQD from Kilo Wharf. Orote Point Airfield runways are used for vertical and short field military aircraft. They provide a large flat area that supports Field Training Exercise, parachute insertions, emergency vehicle driver training, and EOD and Special Warfare training. The airfield is on the National Register of Historic Places.
- The Orote Point Close Quarter Combat Facility, commonly referred to as the Killhouse, is a small one-story building providing limited small arms live-fire training. Close Quarter Combat is one activity within MOUT-type training. It is a substandard training facility and the only designated live-fire Close Quarter Combat facility in the MIRC.
- The Orote Point Known Distance Range supports small arms and machine gun training (up to 7.62 millimeter [mm]), and sniper training to a distance of 500 yards (457 m). The Orote Point Known Distance Range is a long flat cleared area with an earthen berm that is used to support marksmanship. The Orote Point Known Distance Range is currently being upgraded to an automated scored range system. The range generates a SDZ over the Navy submerged land. There is restricted access to the area during training and a NOTMAR/NOTAM is issued.

- The Orote Point Triple Spot is a helicopter landing zone on the Orote Point Airfield Runway. It supports personnel transfer, logistics, parachute training, and a variety of training activities reliant on helicopter transport.
- Agat Bay supports deepwater Mine Countermeasure training, military dive activities, and parachute insertion training. Underwater detonation charges up to 20 pounds NEW are used. Hydrographic surveys to determine hazards for military approaches are periodically conducted in this area.
- Tupalao Cove provides access to a small beach area capable of supporting a shallow draft amphibious landing craft. It supports military diving activities and hydrographic survey training.
- Drop Zones in the offshore areas are used for the air-to-surface insertion of personnel/equipment (see Figure 8.1-14).
- The Piti and Agat Bay Floating Mine Neutralization Area lies north and south, respectively of Apra Harbor and supports EOD training, with underwater explosive charges up to 20 pounds NEW.

Inner Apra Harbor Assets and Uses

Access to Inner Apra Harbor is limited to military use. No recreational uses occur in Inner Apra Harbor. Port Operations controls the use of the wharves and moorings, but there are areas designated for specific types of operations. The following discussion is organized clockwise around Inner Apra Harbor beginning with Polaris Point (see Figure 8.1-14) and is based on the Waterfront Functional Plan of 2004 (NAVFAC Pacific 2004).

Submarines and the Submarine Tender (Class AS-40) are generally docked at Polaris Point, Alpha and Bravo Wharves, but can use other Inner Apra Harbor wharves as needed (see Figure 8.1-14). The AS-40 is typically berthed perpendicular (med-moored) to Alpha Wharf with the ability to nest submarines on either side. Alpha and Bravo Wharves were upgraded in 2008 and construction dredging was required. Munitions operations to support the submarines generate an ESQD arc, as shown on Figure 8.1-14.

The eastern portion of Inner Apra Harbor, between Alpha Wharf and X-Ray Wharf, is undeveloped and naturally vegetated (refer to Figure 8.1-14).

Supply ships that are not carrying fuel or munitions are docked in Inner Apra Harbor, with X-Ray Wharf being the location for onloading and offloading ship supplies. There are large temperature-controlled warehouses at X-Ray Wharf for food storage.

The entire length of the western side of the Inner Apra Harbor, including the Former SRF area, is developed with wharves as follows from south to north: Victor, Uniform, Tango, Sierra, Romeo, Papa, Oscar, Mike, and Lima.

Victor Wharf is the longest of the wharves and has six berths. The USCG operates from their compound on Victor Wharf. It owns 200 ft (61m) and lease another 250 ft (76m) (since 1971) and another 260 ft (79 m) (since 2006) along the wharf. There is an area adjacent to the wharf for USCG support facilities. Limited munitions operations are allowed at Victor Wharf and the ESQD arc is shown on Figure 8.1-13. The security compound, including the military working dog kennels, is south of the USCG support facilities.

Uniform Wharf is only suitable for small craft due to existing structural damage. Navy headquarters is located west and inland of Uniform Wharf. Two berths are located at Uniform Wharf.

Port Operations facilities, the Dive Locker and the hyperbaric chamber are located at Tango Wharf (Building 3169). Approximately 100 ft (31 m) of the wharf is reserved for emergency access.

Sierra and Romeo are general purpose wharves and have limited munitions handling capabilities that generate ESQD arcs as shown on Figure 8.1-14.

The Guam Shipyard lease area includes the following wharves: November, Mike, Lima, Oscar, Papa, and Quebec in Inner Apra Harbor, but only November and Mike Wharves are used. November Wharf is used to berth ships for pierside repairs and Mike Wharf is used to berth a floating crane.

All Inner Apra Harbor wharves, except Alpha and Bravo, are in substandard condition (NAVFAC Pacific 2004) but are used for ship berthing.

Inner Apra Harbor Dredge Depth

In 1945, the Inner Apra Harbor wharves, the ship repair facility, Polaris Point, and Glass Breakwater were constructed of fill material. The construction depth of the southern portion of Inner Apra Harbor fronting the wharves was -32 ft (-9.7 m) mean lower low water (MLLW) and depth in the northern portion was -35 ft (-10.7 m) MLLW. Maintenance dredging occurred in 1978 and 2003 (NAVFAC Pacific 2008a). In 2007, the construction depth of the Inner Apra Harbor Channel and an area south of the Inner Apra Harbor Channel was dredged to -40 ft (-12 m) MLLW to accommodate a new class of ship at Bravo Wharf.

Outer Apra Harbor Assets and Uses

In addition to ship traffic, Outer Apra Harbor is used for military training and recreational activities (e.g., Atlantis Submarine, SCUBA diving, sailing, jet skiing, and canoe paddling). The Outer Apra Harbor description is clockwise beginning in the northwestern end of Outer Apra Harbor. The Outer Apra Harbor is bordered by 2.8 mile (mi) (4.5-km) long Glass Breakwater (Navy property) to the north and Orote Peninsula to the south (refer to Figure 8.1-14). The Commercial Port is on the northeastern edge of the harbor. A civilian marina, Harbor of Refuge, is located at the eastern end. The Navy fueling wharves (Echo/Delta) are approximately 800 ft (244 m) south of the Commercial Harbor on Dry Dock Island. Training activities also occur on Dry Dock Island as discussed earlier in this section. Between Dry Dock Island and the “point” of land at Polaris Point is the GovGuam-designated Sasa Bay Marine Preserve. The “point” has a restaurant/bar and navigational aids. Between the “point” and the northern coast of Polaris Point is Griffin Beach, which is used for military recreation. There are ballfields and open space areas east of Griffin Beach. Along the northern coast of Polaris Point is remnant mooring dolphins and some Navy documents refer to the area as Charlie Wharf. No ships are moored in the area. There is a guard tower and other minor utility buildings at the Charlie Wharf area, but the modern manmade coastline is generally undeveloped. The interior of the Polaris Point area is vacant and landscaped. The other waterfront areas of Polaris Point are discussed under Inner Apra Harbor.

The Guam Shipyard finger piers located west of the Inner Apra Harbor Channel are not used. The dry dock, the former AFDB-8 named “Big Blue”, is located at the northwestern edge of the Former SRF. Drydock Inlet and Sumay Cove Marina are located west of the dry dock. Gab Gab Beach is a recreational area on the northern coast of Orote Peninsula west of Sumay Cove. The DoD munitions wharf, Kilo Wharf, is located west of Gab Gab Beach near the entrance to Outer Apra Harbor (refer to Figure 8.1-14). The munitions operations at Kilo Wharf often require closure of the western portion of Gab Gab Beach for safety reasons. Access to Orote Point and Spanish Steps is also restricted. Kilo Wharf is the current berthing location for visiting aircraft carriers, which visit an average of three times per year, for a week’s duration each time.

On the south side of the Naval Base Guam is the Orote ERA (ERA and recreational beaches, but no wharves or piers).

Outer Harbor Dredge Depth

The original construction depth for the Outer Apra Harbor shipping lane that is located north of the Inner Apra Harbor Channel has been estimated between -40 (-12 m) and -50 ft (-15 m) MLLW based on coral surveys (Volume H). No maintenance dredging has occurred for the area. The primary navigation channel aligned east-west in Outer Apra Harbor is deep, and no construction dredging has occurred to accommodate Navy or other ships. Kilo Wharf was constructed in 1989 in Outer Apra Harbor near the entrance channel with a construction depth of -45 ft (-13.7 m) MLLW. The wharf was extended and the construction depth modified to -47 ft (-14.3m) MLLW in 2008-2009 (COMNAV Marianas 2007).

ESQD Arcs

There are ESQD arcs associated with Alpha, Bravo, Kilo, Romeo, Sierra, and Victor Wharves, and specified mooring buoys, which allows them to be used for munitions operations up to a specified NEW. Kilo Wharf is the primary munitions wharf. ESQD arcs may encumber the navigation channel through Outer Apra Harbor, portions of Hotel Wharf at the Port Authority of Guam and recreational activities in the harbor depending upon the NEW. The arcs shown on Figure 8.1-14 are the Inhabited Building Distance arcs, within which buildings that are routinely inhabited are not permitted for safety reasons. Smaller diameter public transportation route ESQD arcs (not shown on Figure 8.1-14) are generated from the munitions operation site. The public transportation route refers to public street, road, highway, navigable stream, or passenger railroad, including roads on a military reservation used routinely by the general public for through traffic. Both arcs extend over the shipping channel in Outer Apra Harbor encumbering maritime traffic and recreational use when the munitions operations are occurring. On Orote Peninsula, there are other facilities that generate arcs because they are used for temporary or long-term munitions storage.

Navy Dredged Material Management

The Navy conducts dredging periodically in Apra Harbor to maintain construction depth and to accommodate new classes of ships. To date, the Navy's alternatives for dredged material management have been beneficial reuse and upland placement sites. A third alternative (ODMDS) is anticipated to be designated and available for use in 2010. The proposed action involves dredging in the area of Sierra Wharf.

Beneficial Reuse

Beneficial reuse projects are the preferred alternative for dredged material disposal. Some beneficial reuse Alternatives include beach replenishment, construction fill, and landfill cover. Specific projects and sites have not been specified for the dredged material generated by the proposed action. Land use impacts associated with these projects are not addressed in this EIS/OEIS. However, as beneficial reuse projects, such as land reclamation emerge, appropriate analysis would be conducted.

ODMDS

The USEPA has designated (pending) an ODMDS approximately 13 nm (25.4 km) west of Apra Harbor. The affected environment and impact assessment for the site is described in the ODMDS-specific EIS (USEPA 2009). From a submerged land use perspective, the ODMDS site was specifically selected to avoid existing submerged land uses, such as shipping lanes and fishing areas. As mentioned in the project description, the suitability of the dredged material for ODMDS disposal is demonstrated through physical,

chemical and biological testing, per USEPA Ocean Dumping Regulations (40 CFR Parts 220, 225, 227, and 228). Only dredged materials that meet the testing parameters are eligible for ODMDS disposal. Preliminary sediment characterization study results indicate that all or most of the dredged material is likely to be suitable for ODMDS disposal. A comprehensive analysis would be completed in support of the U.S. Army Corps of Engineers (USACE) permit. This EIS/OEIS assumes four scenarios: 100% disposal in the ODMDS, 100% upland disposal, 100% beneficial reuse and 15-20% beneficial reuse/75-80% ocean disposal.

Candidate Upland Placement Sites

As described in Chapter 2, it is often necessary to store dredged material before it can be beneficially reused. In these cases, an upland placement site is needed. The existing upland placement sites on Guam are at, or soon to be at, maximum capacity. Establishing new upland placement sites can be difficult for the following reasons:

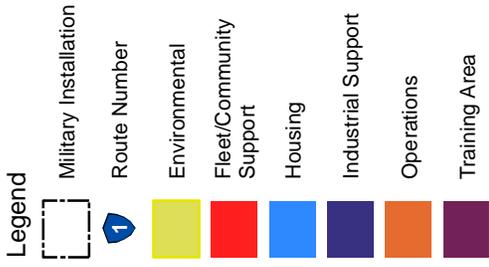
- There may be insufficient capacity at the upland placement facilities for stockpiling material.
- Priority would be given to containment of material that is unsuitable for ocean disposal.
- New upland placement facilities can be time-consuming to create, conflict with other land uses, and have their own environmental impacts.

Five potential new upland placement sites were identified (NAVFAC Pacific 2008b) to support proposed Navy dredging projects. The selection of a specific site for the proposed action dredged material has not been determined. The sites are Fields 3, 4, and 5, Public Works Center (PWC Compound) and Polaris Point. The sites are vacant (i.e., no modern manmade structures). Characteristics of the sites are described in Volume 9, Appendix D. Three of the sites, Fields 3 and 5 and Polaris Point, have been addressed in previous NEPA documents and will not be assessed in this EIS. Field 4 and PWC Compound sites are addressed in this EIS/OEIS.

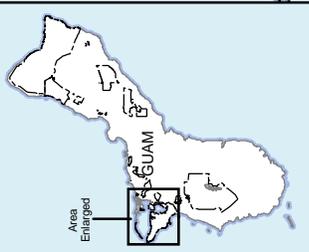
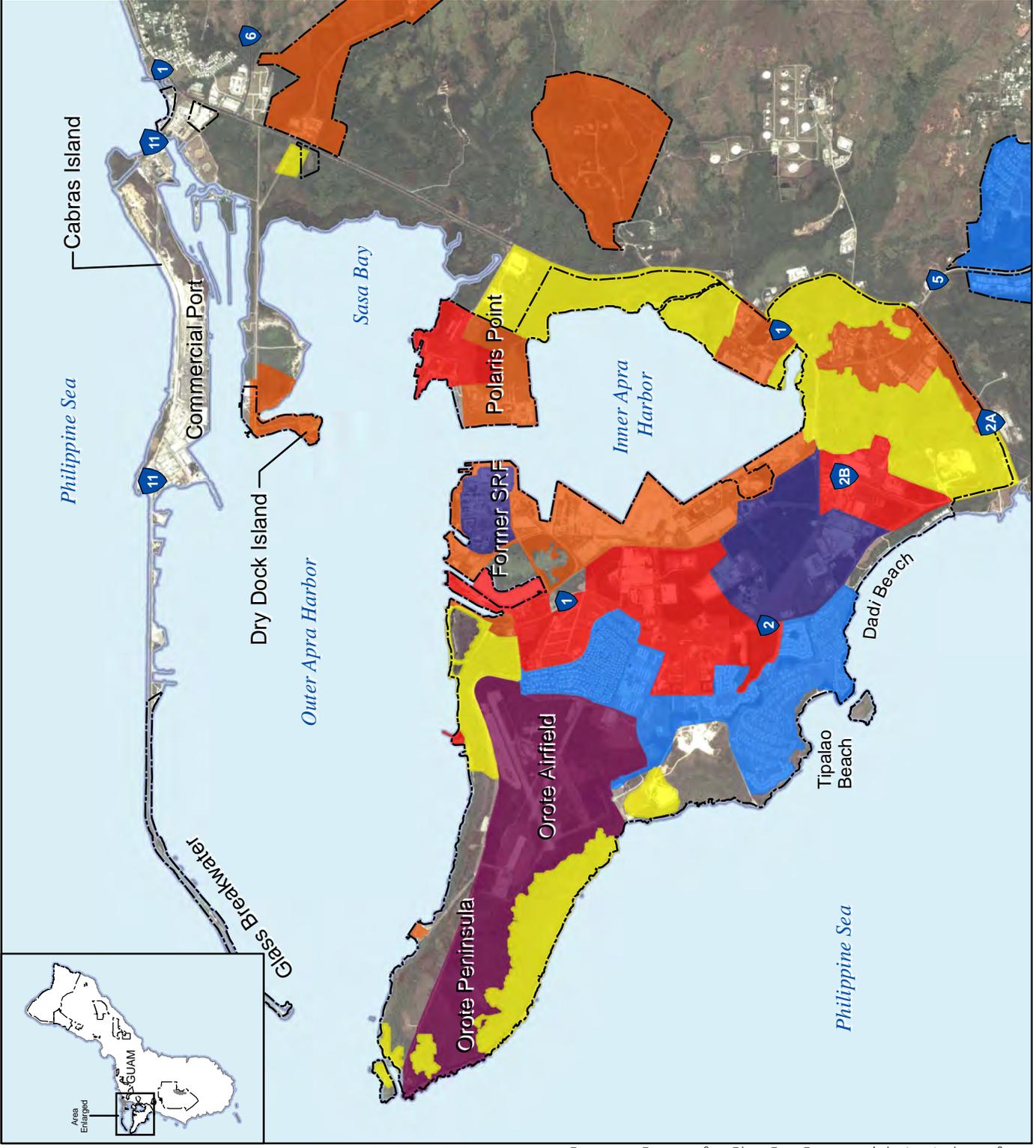
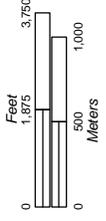
8.1.4.2 Naval Base Guam

The Navy does not have zoning laws or codes, but there are functional relationships among land uses that guide development. In general, the working zone, which includes industrial, waterfront, operational and mission support functions (i.e., supply, maintenance), are distinct from the living areas that include housing and community support. Figure 8.1-15 shows the May 2008 land use plan for Naval Base Guam generated by Naval Facilities Engineering Command (NAVFAC) Marianas Asset Management Business Line (COMNAV Marianas 2008). “Operations” refers to waterfront operations (e.g., administration and wharves, submarine compound, supply facilities including fuel storage, and Camp Covington [construction battalion compound]). Industrial support includes ship repair, warehousing, and maintenance. Training areas are identified on Orote Peninsula. Environmental is a broad term referring to historical and archeological, natural resources, wetlands, and installation restoration (clean-up) sites. The wetlands delineated on the plan are not precise and are addressed in other chapters of this EIS/OEIS. The Base Commander, in consultation with base planners, would direct future development to be consistent with the objectives of the land use plan, which is subject to change. ESQD arcs are a major constraint on land use development, especially for Orote Peninsula. Naval Base Guam is more densely developed than Andersen AFB, but the building heights are similar.

Figure 8.1-15
Naval Base Guam
Land Use Plan



Source: NAVFAC 2008



Adjacent Land/Submerged Land Uses

The Navy Main Base has submerged lands in three directions: north, west, and south. The submerged land uses around Naval Base Guam have been described for the harbor. Military training sites are described in the previous sections. Recreational and commercial uses are described under other resource chapters.

Adjacent non-federal land is located to the east of Naval Base Guam. Marine Drive (Route 1) and Route 2A generally delineate the eastern boundary, except for the Dry Dock Island and Polaris Point portions of Naval Base Guam that are bordered by non-federal vacant (i.e., no modern manmade structures) and vegetated land. The land areas east of the adjacent roadways are vacant, except for a bus depot at the south boundary (refer to Figure 8.1-4). No prime or important farmlands were identified adjacent to Naval Base Guam (refer to Figure 8.1-3).

Port Authority Guam and Vicinity

A new power plant is proposed as one of the long-term power alternatives. It would be located within and adjacent to the existing Piti/Cabras Power Plant (Figure 8.1-16), as described in Volume 6 of this EIS/OEIS. The boundary of the parcel required has not been delineated, however assumptions were made based on existing roadways and property boundaries. The northeastern boundary is assumed to be the southern edge of the existing GPA power plant property. The northwest boundary is the Piti fuel storage facility. The eastern and southern boundaries are delineated by Route 1 (Marine Drive) and Route 18, respectively. There is a road leading to the Harbor of Refuge and a fuel storage facility along the west boundary. There are no important or unique farmlands identified at the site (refer to Figure 8.1-3). The area appears vacant (i.e., no modern manmade structures) and naturally vegetated with some areas of ground disturbance (GovGuam 2008).

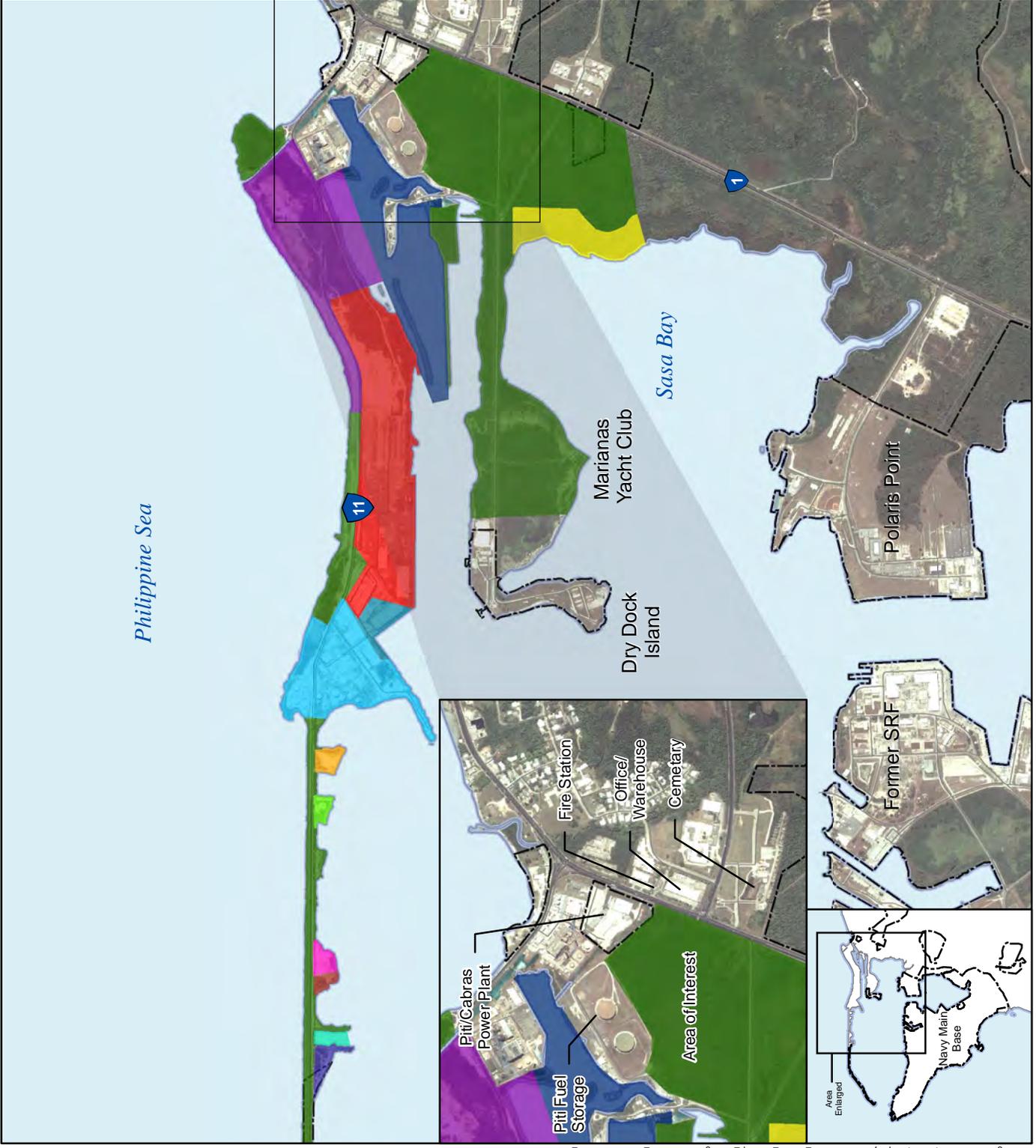
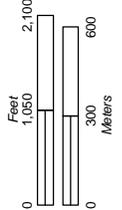
The property is owned by GovGuam. Historically, the area and adjacent lands were federal land and were authorized to be transferred to PAG under the Brooks Amendment for port-related activities. The lands have been transferred to GovGuam, and the Port Authority of Guam Draft Master Plan Update 2008 identifies the area as open space (PAG 2008). Industrial uses are located northeast (power plant) and northwest (fuel storage tanks). Additional open space is located along Route 18 toward Dry Dock Island and south of the property near Route 18. East of Marine Drive (Route 1) is a cemetery, and GovGuam facilities including a fire station, warehouses and offices.

8.1.4.3 Off Base Roadways

The proposed roadway improvement projects within the Apra Harbor Region are located along existing Routes 1, 2A, and 11, including two pavement strengthening projects (GRN #24 and 26), one MAP project (GRN #50), one intersection improvement project (GRN #5), and a roadway rehabilitation project (GRN #4), as summarized in Table 8.1-5. In addition, three bridges along Route 1 would be replaced (GRN project number is listed in Central Region). The locations of various proposed projects in the Apra Harbor Region are shown in Figure 8.1-17.

Figure 8.1-16
Commercial Port &
Vicinity Land Use

- Legend**
- Military Installation
 - Route Number
 - Commercial Cargo Terminal
 - Family Beach - Fishing
 - Fishing Industry Area
 - Fueling Facilities & Cement Unloading
 - Golf Pier
 - Hotel Wharf - Dinner Cruise
 - Hotel Wharf - Fishing
 - Cabras Island Industrial Park
 - Natural Preserve
 - Open Space
 - Pier Dog
 - Piti Channel Area
 - Seaplane Ramp
- Source: Port Authority of Guam 2008



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Figure 8.1-17
Apra Harbor - Roadway
Project Locations

Legend

-  Military Installation
-  Route Number
-  Project Locations and GRN#
-  Bridge Replacement
-  Intersection Improvement
-  Military Access Point
-  Pavement Strengthening

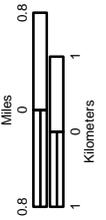


Table 8.1-5. Proposed GRN Projects in Apra Harbor Region

<i>Route</i>	<i>GRN#</i>	<i>Segment Limits</i>	<i>Pavement Strengthening</i>	<i>Intersection Improvements</i>	<i>Rehabilitation</i>	<i>Bridge Replacement</i>	<i>Military Access Point</i>
1	24	Route 11 to Route 2A	X				
1	50	Naval Base Guam					MAP 14
2A	26	Route 1 to Route 5	X				
11	4	Port to Intersection with Route 1			X		
11	5	Route 1/11 Intersection		X			

Note: Roadway projects in the Apra Harbor Region are the same for Alternatives 1, 2, 3, and 8.

A pavement strengthening project (GRN #24) and a MAP project (GRN #50) are proposed along Route 1 within this geographic region. GRN #24 extends from the intersection of Route 11 to Route 2A. Land uses west of the project alignment include vacant land; conservation land, including the Sasa Bay Marine Preserve; and DoD lands, including Polaris Point and Apra Harbor Naval Complex. Land uses east of the project alignment include urban residential; public facilities, including Guam Public School System and General Services Administration facilities; Guam Veterans Cemetery; Sasa Valley Tank Farm; and commercial land uses near the southern terminus of the project. Ocean uses near the project include the Sasa Bay Marine Preserve. The project also crosses the Atantano, Sasa, and Aguada Rivers.

Route 2A is an inland roadway that connects Routes 1, 5, and 2. A pavement strengthening project is proposed on Route 2A from Route 1 to Route 5 (GRN #26). Land uses adjacent to the project include DoD land (i.e., Apra Harbor Naval Complex), vacant, agriculture/non-urban residential, urban residential, commercial, and industrial. Ocean uses are not near this project.

Route 11 is a roadway that connects Route 1 with the Commercial Port. A two-lane rehabilitation project from the Commercial Port on Cabras Island to Schroeder Junction (the intersection of Routes 11 and 1) (GRN #4) and the Schroeder Junction improvement (GRN #5) are proposed along Route 11. Land uses south of the projects include Kaiser Cement and GovGuam facilities (i.e., Port Authority of Guam [PAG] office building), the Commercial Port, Cabras Power Plant, and Piti Power Plant. Land use north of the project is primarily vacant beach land; Hoover Park is located near the northeastern terminus of the project. Ocean uses near the project include Amphitheater dive spot located in the Philippine Sea and the Piti Bomb Holes Marine Preserve at the northeastern terminus of the project. A thermal outfall from the power plants is located adjacent to the project area at the eastern end of Cabras Island.

8.1.5 South

The data sources used in describing Apra Harbor were also used in this discussion of South Guam land use affected environment. The relevant land area in the south is the Naval Munitions Site (NMS).

8.1.5.1 Naval Munitions Site

NMS is the largest DoD property on Guam at 8,645 ac (3,499 ha) and consists of the naval munitions area and the Fena watershed areas, 75% of which is within explosive safety arcs (Figure 8.1-18) (Navy 2009). It is located approximately 6 mi (9.6 km) south of Naval Base Guam. Vehicular access is provided by Route 1 and Route 5. Naval Munitions Command Detachment Guam is headquartered at NMS. The explosive storage and associated administrative facilities are located in the northern portion of the site.

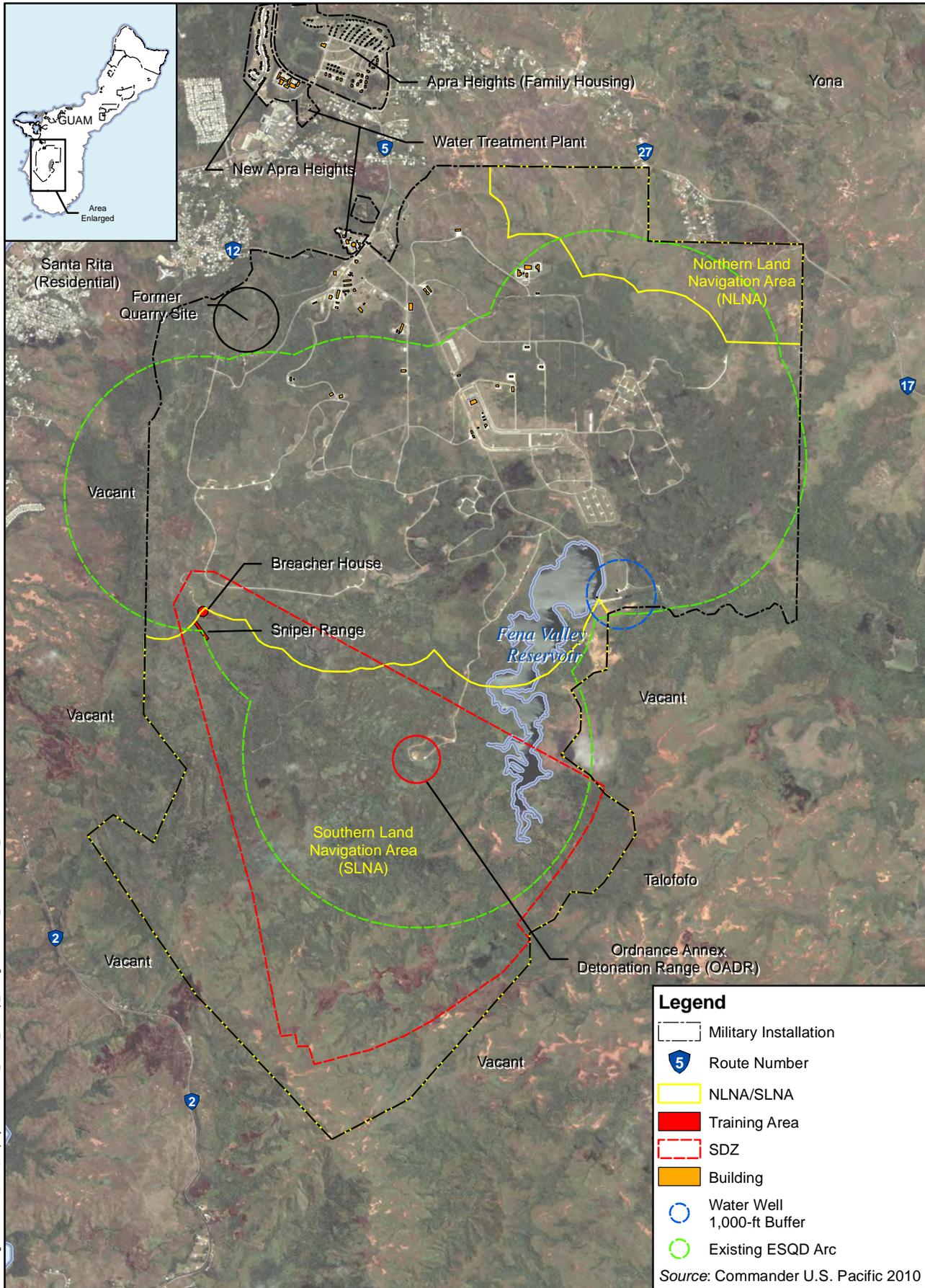


Figure 8.1-18
Naval Munitions Site Land Use



NMS is the westernmost munitions supply point on U.S. soil and is a vital link to the munitions logistics system supporting the Navy's 7th Fleet.

There are training facilities at NMS that are described in the MIRC EIS/OEIS (Navy 2009) (see Figure 8.1-18) as follows:

- The breacher house is a concrete structure in an isolated part of NMS that is used for tactical entry using a small explosive charge. Live-fire is not authorized in the breacher house. An adjacent flat area allows for a helicopter LZ supporting airborne raid type events.
- The Emergency Detonation Site is located within a natural bowl-shaped high valley area within NMS and is used for emergency response detonations for up to 3,000 pounds (1,360 kg) of explosives. A flat area near Emergency Detonation Site allows for helicopter access. EOD activities are the primary types of training.
- The Sniper Range is an open terrain, natural earthen backstop area that is used to support marksmanship training. The Sniper Range is approved for up to .50 caliber sniper rifle with unknown distance targets.
- The northern land navigation area is located in the northeast corner of NMS where small unit and foot and vehicle land navigation training occurs.
- The southern land navigation area is located in the southern half of NMS where foot- land navigation training occurs.
- Air training activities occur at NMS, including combat search and rescue, insertion/extraction, and fire bucket training.
- Fena Reservoir is the largest freshwater body on Guam and the protected watershed encompasses approximately half (3,670 ac [1,485 ha]) of NMS. There are numerous streams flowing through the installation. There are unimproved roads at the southeast and southwest portions of the site that extend offsite.

Adjacent land use is rural except the residential areas northwest and north of NMS (Navy 2009). The same land use designation is shown at the northeast corner. Other adjacent areas are designated as Undeveloped. No prime or important farmlands were identified adjacent to NMS, except for a small area of important farmland on the southeastern boundary (refer to Figure 8.1-18).

8.1.5.2 Non-DoD Lands

Non-DoD areas of interest for the proposed action would be adjacent to NMS to the south or southeast and would be limited to an access road to the southern portion of NMS at one of three locations. The area, known as the Guam Territorial Seashore Park, appears largely vacant (i.e., no modern manmade structures) and vegetated with some unimproved roads (Bureau of Statistics and Plans 2008). The area is regulated by the Chamorro Land Trust. The area of important farmlands that is adjacent and southeast of NMS extends to the east. There is a discrete area of prime farmland located north of these important farmlands (refer to Figure 8.1-3).

A new power plant is proposed as one of the long-term power alternatives (Volume 6). It would be located within and adjacent to the existing Piti/Cabras power plant as described in Volume 6 of this EIS/OEIS. The boundary of the parcel required has not been delineated and assumptions were made based on existing land use boundaries. The northeastern boundary is assumed to be the southern edge of the existing GPA power plant property. Northwest is the Piti fuel storage facility. The eastern and southern boundaries are delineated by Route 1 (Marine Drive) and Route 18, respectively. There is a road leading to the Harbor of Refuge and a fuel storage facility along the west boundary. There are no important or

unique farmlands identified at the site (refer to Figure 8.1-3). The area appears vacant (i.e., no modern manmade structures) and naturally vegetated with some areas of ground disturbance (Bureau of Statistics and Plans 2008).

The property is owned by GovGuam. Historically, the area and adjacent lands were federal lands and are designated “military” (Territorial Planning Council 1994). The lands have been returned to GovGuam and the Draft Port Authority of Guam Master Plan Update 2007 identifies the area as Open Space (PAG 2008). Surrounding land uses are mixed. Industrial uses are located northeast (power plant) and northwest (fuel storage tanks). Sasa Bay Marine Preserve is naturally vegetated, vacant, and located south of the property of interest and Route 18. East of Marine Drive (Route 1) is a cemetery and GovGuam facilities: fire station, warehouses, and offices.

8.1.5.3 Off Base Roadways

Roadway improvement projects within the south region are located in the village of Santa Rita, including two pavement strengthening projects on Route 5 (GRN #25 and 27), a roadway modification on Route 2 (GRN #110), and a military access point (MAP) project on Route 12 (GRN #52), as summarized in Table 8.1-6. The locations of various proposed projects in the south region are shown in Figure 8.1-19.

Table 8.1-6. Proposed GRN Projects in South Region

<i>Route</i>	<i>GRN#</i>	<i>Segment Limits</i>	<i>Pavement Strengthening</i>	<i>Intersection improvement</i>	<i>Military Access Point</i>
5	25	Route 2A to Route 17	X	X	
5	27	Route 17 to Naval Ordnance	X		
12	52	Naval Munitions Site			MAP 16
2	110	Route 2/12 Intersection		X	

Note: Roadway projects for Alternatives 1, 2, 3 and 8 include all projects listed above.

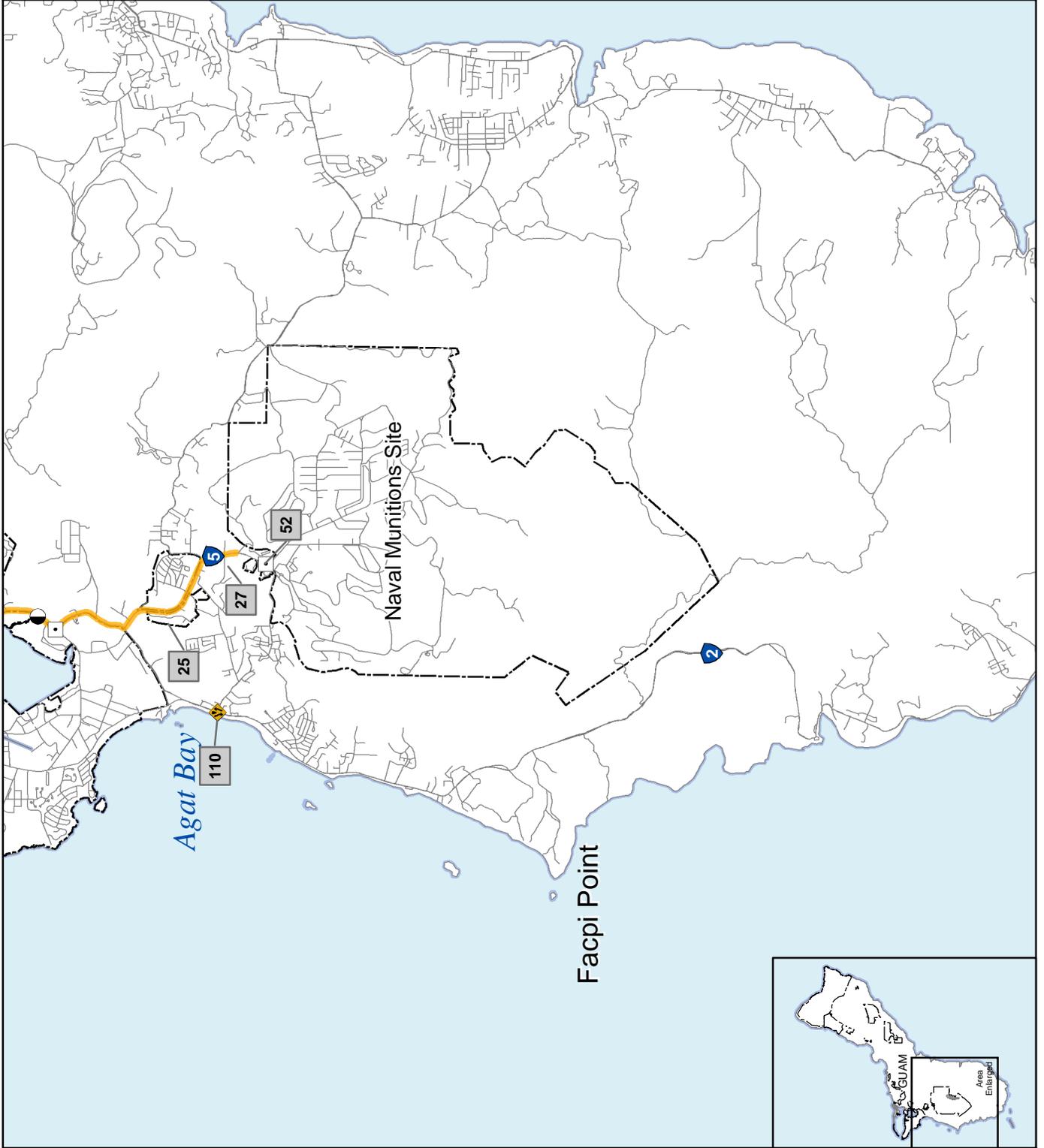
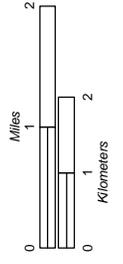
Route 5 is an inland roadway that connects Routes 2A and 12. GRN #25 and 27 on Route 5 are located within the communities of Apra Heights and New Apra Heights in the village of Santa Rita. The surrounding land uses include Navy Housing, the Apra Heights reservoir, vacant land, agricultural/non-urban residential land uses, and community facilities (i.e., Church of Jesus Christ of Latter Day Saints and McCool Elementary School). No ocean uses are within the vicinity of Route 5.

Route 12 is an inland roadway that connects to the intersection of Routes 2 and 2A. Route 2 runs along the west coast of the island adjacent to the Philippine Sea. Improvements within this area include relocation of MAP 16 in the village of Santa Rita (GRN #52) and intersection improvements to the Route 2/12 intersection (GRN #110). Surrounding land uses within the vicinity of these projects include agricultural/non-urban residential, Fena Water Treatment Plant, and NMS. Several beaches and tourist activities are located along the coastline on which Route 2 is located.

Figure 8.1-19
 South - Roadway
 Project Locations

Legend

-  Military Installation
-  Route Number
-  Project Locations and GRN#
-  Bridge Replacement
-  Intersection Improvement
-  Military Access Point
-  Pavement Strengthening



8.2 ENVIRONMENTAL CONSEQUENCES

This description of environmental consequences addresses all components of the proposed action for the Marine Corps on Guam. The components addressed include: Main Cantonment, Training, Airfield, and Waterfront. There are multiple alternatives for the Main Cantonment, Training-Firing Range, Training-Ammunition Storage, and Training-NMS Access Road. Airfield and Waterfront do not have alternatives. Although organized by the Main Cantonment alternatives, a full analysis of each alternative, Airfield, and Waterfront is presented beneath the respective headings. A summary of impacts specific to each alternative, Airfield, and Waterfront is presented at the end of this chapter. An analysis of the impacts associated with the off base roadways is discussed in Volume 6.

8.2.1 Approach to Analysis

There are two components to the land use analysis: 1) land/submerged lands ownership and management, and 2) land/submerged land use. There are different criteria for assessing potential impacts under these two categories. Short-term impacts would be related to facility construction activities that would be located within the project footprint or on previously disturbed lands. No construction staging area has been designated away from the project site. These construction activities would have minimal and localized impacts on land use. All impacts related to land ownership and use are assumed to occur during the long-term operational phase of the proposed action as the changed conditions would alter the development and use of the current site and its vicinity.

The potential indirect impacts that would be due to changes in land ownership and use are addressed under other specific resource categories such as traffic, noise, natural resources and recreation. Federal actions on federal lands are not subject to local zoning or land management regulations; however, consistency with surrounding non-federal land uses is an important consideration in land use planning. Coastal Zone Management Act consistency determination assessment is being prepared for all Guam proposed action and the correspondence will be included in the Final EIS/OEIS appendices.

8.2.1.1 Determination of Significance - Land Ownership/Management

The impact assessment methodology for land/submerged land ownership and management is not dictated by regulatory authority or permit requirements. The basic premise is that a release of federal lands/submerged lands to GovGuam or individuals have beneficial impacts on the new landowners. Conversely, the taking of land by the federal government may be considered an adverse impact on the entities that are losing ownership or control of their property. "Taking property" in this discussion refers to a situation where the property owner is legally required to sell property to the federal government. There may be some owners who are interested in selling or leasing land to the federal government and would perceive the federal acquisition or lease of their property as a beneficial impact. Other owners who do not want to sell their property (or relocate) are likely to consider the forced sale or relocation as an adverse impact even though they are properly compensated. Until the land negotiations are complete, the impact analysis assumes a significant impact on the individual landowner. There are exceptions to this significant impact for minor rights-of-way and easements for utilities. Mitigation for the taking of property that is not acceptable to the landowner may be a long-term lease agreement instead of purchase where the property returns to the owner on termination of the lease.

The comments received during the scoping period did not support an increase in federal land on island and the increase is considered an adverse impact by some members of the public (refer to Section 8.2.2 for a summary of issues raised during the scoping process). The impacts of the proposed island-wide increase in federal land are being addressed in the Land Acquisition Impact Study portion of the

Socioeconomic Impact Assessment Study that is being developed and will be available as part of the Final EIS.

There are no indirect impacts associated with changes in land ownership, except for those that would be discussed under other resource categories. For example, changes in land ownership may impact potential tax revenue to GovGuam, a potential indirect impact on socioeconomics.

Changes in land ownership may result in access restrictions to non-federally controlled land. This may be an adverse impact and is considered in the land ownership assessment.

8.2.1.2 Determination of Significance – Land Use

The land use impact analysis is based on operational impacts, except for dredging and dredged material disposal management. The assumption is that construction staging and equipment area would be located on DoD land. There would be no land/submerged land acquisition, or restrictions on public access during the construction phase. No farmlands would be lost and construction land use impacts would be temporary. The disturbed area would be situated on previously disturbed land or within the project footprint; therefore, there would be no potential adverse impacts to land use due to construction.

There are three criteria that are applied for assessing impacts on land and submerged land use:

- Consistency with Farmland Protection Policy Act (FPPA) of 1981 (not applicable to submerged lands).
- Consistency with current or documented planned land and submerged land use. Land use consistency includes impacts on access policies and loss of open space.
- Restrictions on access due to changes in land use.

Land Use Criterion 1: FPPA

The FPPA (Public Law 97-98, 7 USC 4201 and 7 CFR 658) is intended for federal agencies to: 1) identify and take into account the potential adverse effects of federal programs on the preservation of farmland land; and 2) consider alternative actions, as appropriate, that could lessen such adverse effects; and assure that such federal programs, to the extent practicable, are compatible with state, unit of local government, and private programs and policies to protect farmland. The FPPA addresses prime and important farmlands. Actions that are not consistent with this FPPA are considered to have an adverse impact and determination of significance is a qualitative assessment of the value of the farmland affected. DoD lands on Guam are not currently used or planned for agricultural use and there would be no FPPA impact associated with changes in DoD land use within the property boundary. The non-DoD lands proposed for acquisition could potentially be used for farming and the potential impacts are assessed.

Land Use Criterion 2: Consistency with current or documented planned land use

Land use plans are intended to guide future development. Potential adverse land use impacts would result from a proposed land use that is incompatible with the existing land use or planned land use or if vacant (i.e., no modern manmade structures) land and open space is developed. It is possible for land uses to be inconsistent, but not necessarily incompatible. For example, residential development next to a park is inconsistent, but compatible, while an industrial facility proposed within a residential area would likely be incompatible and inconsistent. Potential adverse impacts would also result if there are incompatible changes in use within submerged lands. Changes in access policies may result from changes in land use and adverse impacts would result if the access became more restrictive to the public.

The test for impact significance is less rigorous for existing DoD land and submerged land, where limited land availability may result in less than ideal land use changes. Federal actions on federal lands/submerged lands are subject to Base Command approval, but are not required to conform with State/Territory land use plans or policies. The proposed action alternatives of this EIS/OEIS have been developed in consultation with Base Command planners. As a result, there would be no anticipated significant impact to land use within DoD parcel boundaries. Land use changes on existing DoD land could be the basis for significant impacts to other resources (such as visual resources, noise, traffic, recreation, cultural and biological resources) within and beyond DoD land boundaries. Impacts to these resources and others are addressed in other resource chapters of this EIS/OEIS.

Proposed land uses on newly acquired lands would have an adverse impact if they are not consistent with the existing or proposed land use at that site. Similarly, a change in use within non-DoD submerged land could have an adverse impact. The test for significance is the degree of incompatibility and is qualitative. For example, proposed military housing would be consistent with existing or planned civilian residential communities and there would be no adverse impact to land use. A proposed industrial facility in an area that is designated for public park would be a significant impact, while the same facility in an area designated for heavy commercial land use would have no significant impact.

While a proposed land use under the action alternatives may be consistent with existing land use, there is potential for adverse impacts due to changes in land use intensity. For example, a training range that is used once per month may have an adverse impact if it were to be used daily. Potential adverse impacts associated with changes in land use intensity such as increases in marine traffic (Chapter 14), noise (Chapter 6), and unexploded ordnance (Chapter 18) are addressed under other resource area discussions of this EIS/OEIS. No significance criterion is established for land use intensity impacts. Noise from airfields or training may be a land use constraint and is discussed.

Land Use Criterion 3: Restrictions on access

Additional restrictions on public access would be a potential adverse impact. For example an increase in the setback distance from Navy ships for security purposes may restrict access to a SCUBA site. The test for significance is subjective and based on geographic area affected, the schedule or timing of the access restrictions (permanent or occasional), and the population affected.

Physical access restrictions can result if land acquisition by the federal government results in a pocket or island of non-federal land. This would be an adverse impact on the landowner(s) of the pocket of land. The significance of the impact is based on the extent to which the non-federal land is bordered by military land. Significant impacts result when the private property is surrounded by military property because there would be access restrictions and other potential land use limitations to the private property. Similarly, pockets of civilian land use within a DoD installation is an adverse impact on military land use.

Access restrictions have potential indirect impacts on other resources and are discussed in other chapters of this EIS/OEIS.

8.2.2 Issues Identified During Public Scoping Process

As part of the analysis, concerns related to land use and ownership that were mentioned by the public, including regulatory stakeholders, during the public scoping meetings were addressed. Many of the scoping issues raised regarding land use relate to other resource areas such as noise and recreation and are discussed under those chapters. The following are issues that were identified through the scoping process:

- No increases in federal land ownership (although there were some landowners interested to sell).
- No re-acquisition of lands that have been or are in the process of being released by the federal government.
- All land uses proposed on federal land would be consistent with GovGuam land use plans. Specifically, civilian housing should not be adjacent to industrial or training uses on the Base. Yigo and Dededo were areas of concern.
- Federal government would release South Finegayan and Andersen South.
- Current public rights-of-way would be retained.
- No further restrictions on submerged lands recreational use. Current restrictions have interfered with boat races and competitions in Outer Apra Harbor.

8.2.3 Alternative 1

Unlike other EIS/OEIS resource chapters, there is no discussion of construction impacts for land ownership and use. The assumption is the construction would occur within the project development footprint or on previously developed lands with no impact on land use beyond the project footprints described for operations. Construction would not require additional land acquisition or long-term leasing and would not require relocation of existing uses. Nearby land uses would not be altered during construction. The impacts of construction noise and traffic are addressed in other EIS/OEIS chapters. Land use and ownership changes are considered long-term operational impacts.

8.2.3.1 North

Andersen AFB

The proposed activities at Andersen AFB are the same for all action alternatives. No change in land or submerged land ownership is proposed at Andersen AFB and no new public access restrictions would be created. There are no farmlands at Andersen AFB; therefore, FPPA is not relevant.

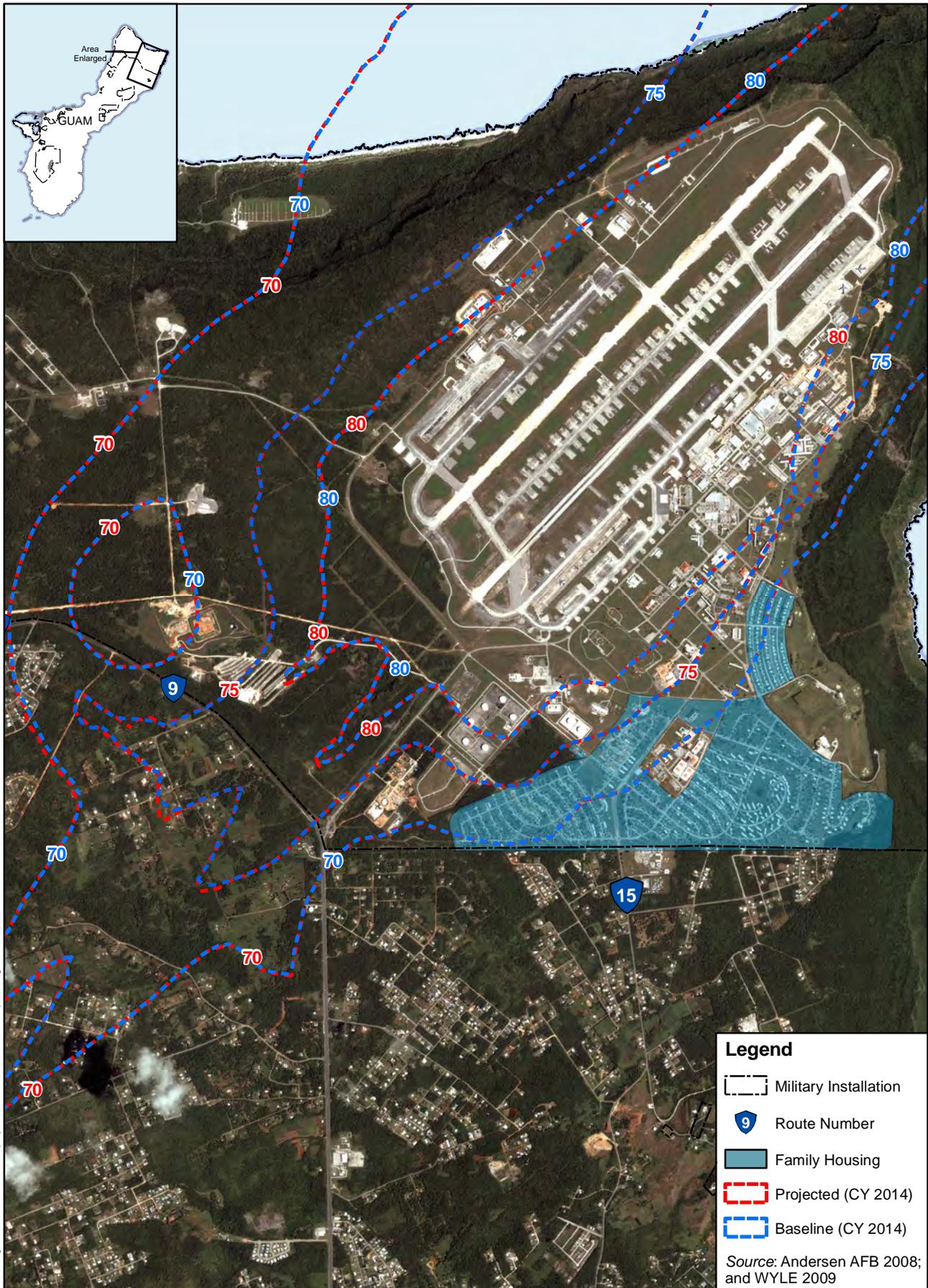
The proposed activities are consistent with Andersen AFB land use plans and include: expansion of airfield activities at North Ramp, new embarkation facilities at South Ramp, new munitions storage buildings in the MSA, new access road and gate, aviation training at existing runways of North Ramp and NWF, and other non-firing training in NWF. There would be development in vacant (i.e., no modern manmade structures) areas that are adjacent to developed areas of similar use and consistent with the Andersen AFB land use plans. The Navy helicopter squadron operations buildings would be relocated a short distance from their existing facilities at North Ramp with no adverse impact anticipated. No other relocations of existing land uses are proposed.

Noise levels associated with proposed Andersen AFB airfield activities would not alter the noise contours appreciably. The proposed 80 dBA noise contour would not extend off-base into the civilian community.

Figure 8.2-1 shows the existing and projected affected areas. The on-base and off-base noise contours are similar and impacts would be less than significant. No land uses would need to be relocated and no planned land uses would be modified to avoid noise impacts. The increased use of NWF for training would result in higher noise levels but the noise impacts would be limited to Andersen AFB boundaries.

No new uses are proposed in submerged lands bordering Andersen AFB and no impacts to submerged lands use are anticipated.

Most of the proposed development would be interior of the base, except the proposed access gate that would create a new lighted intersection on Route 9. The new access road would be aligned along an



Printing Date: Oct 20, 2009; M:\projects\GIS\8806_Guam_Buildup_EI\figures\Current_Deliverable\Vol_2\8.2-1.mxd

- Legend**
- Military Installation
 - Route Number
 - Family Housing
 - Projected (CY 2014)
 - Baseline (CY 2014)

Source: Andersen AFB 2008; and WYLE 2009

Figure 8.2-1
70 dBA Noise Contours



existing roadway that would be widened. The buildings proposed would also be on vacant (i.e., no modern manmade structures) land that has been disturbed. There is a landfill located adjacent to the site and no impact to or from the landfill use is anticipated. Natural resource, cultural resource and installation restoration (i.e., contamination clean-up) sites that are in the vicinity of the access road and truck inspection facility are discussed in other resource chapters. The loss of open space is an adverse impact, but is not significant because it is an underutilized area of the base. South of Route 9 and the proposed intersection, the area is designated for Village Center and Park/Open Space in the *North and Central Guam Land Use Plan* (Bureau of Statistics and Plans 2009). A new access road and entry control gate is consistent with this adjacent use. The potential impacts on adjacent uses are related to traffic, which is addressed in Volume 2, Chapter 14, Transportation.

Under Alternative 1 no significant impacts to land/submerged land ownership or use are anticipated at Andersen AFB.

Andersen AFB Airfield Impact on Civilian Community

Under all action alternatives there would be more air traffic at the Andersen AFB airfield. There would be no change to the accident potential zones at the airfield. As described in Volume 2, Chapter 6 (Noise) and shown on Figure 8.2-1, the projected noise contours generated by airfield activities are not appreciably different from the baseline and no significant land use impacts are anticipated.

At NWF, aviation training noise would not impact land use beyond DoD boundaries. Ground training activities currently detonate 40 pound (18 kg) charges twenty-five times per year, but only one per any given day. The proposed action would add six more detonations to this total, but the training would be three charges per day twice per year. Figure 6.2-2 shows the noise contours associated with this activity. The noise levels would increase, but since the action only occurs twice per year, it would be considered a less than significant impact on land use.

Finegayan

NCTS and South Finegayan

NCTS Finegayan and South Finegayan are federally controlled, as is the submerged land off of the coast of NCTS Finegayan. No change in land or submerged land ownership is proposed at NCTS Finegayan or South Finegayan. There are no farmlands; therefore, FPPA is not relevant. No new access restrictions would be generated by the use of these exiting federal parcels.

The existing small arms range and associated SDZ would be eliminated. This represents a beneficial impact to submerged land use and public access. There would be no change to the existing communications facilities at NCTS Finegayan. Prior to the proposed military relocation, no long-term use was identified for the non-communications facilities at NCTS Finegayan. The buildings that cannot be reused in the redevelopment would be demolished. Vacant (i.e., no modern manmade structures) areas would be developed with a loss of open space. Open space would be incorporated in the design. The loss of open space is an adverse impact to the DoD base, but is offset by the facts that base commands have limited land and expanding missions to accommodate, and use of underutilized space on base decreases need for land acquisition or long-term leasing. The maximum height of the buildings would be six floors. Redevelopment of the area as a main cantonment area for the Marine Corps would be consistent with historical Navy use. The total area proposed for main cantonment development is approximately 1,380 ac (558 ha).

The potential impacts of the Overlay Refuge is discussed in Volume 2, Chapter 10, Terrestrial Biological Resources. No significant impact on land use is expected.

South Finegayan is used for military family housing and under Alternative 1, it would continue to be used for family housing. There would be more family housing units developed on land than was historically used for housing. No significant land use impact is anticipated under Alternative 1 at South Finegayan.

The intensity of land use at NCTS Finegayan and South Finegayan would increase over existing conditions. The impacts of the change in land use intensity are addressed in other resource chapters of this EIS/OEIS.

On the west side of Route 3, existing uses of adjacent non-federal lands are vacant (i.e., no modern manmade structures) lands that surround South Finegayan and are south of NCTS Finegayan. The *North and Central Guam Land Use Plan* (Bureau of Statistics and Plans 2009) identifies the area as the Dos Amantes Planning Area that includes Hotel/Resort and Urban Center land use designations. The proposed land uses on federal land boundaries would be consistent with future development on adjacent properties.

East of NCTS Finegayan and Route 3 the existing and designated future land use is Very Low Density Residential, with the exception of the Village Center land use designation in the vicinity of the southeast corner of NCTS Finegayan.

South Finegayan is adjacent to vacant land to the north, west and south. Residential communities are east of Route 3. The land use designation for future development west of South Finegayan and along Route 3 is Mixed Use and further east beyond the Mixed Use is designated for residential use. The existing land uses and proposed land use designations for future development on adjacent properties are consistent with the proposed development under Alternative 1. No significant impacts are anticipated.

Potts Junction

No change in land ownership is proposed at Potts Junction. No new access restrictions would be generated. There are no farmlands; therefore, FPPA is not relevant. There are no submerged lands associated with Potts Junction because the parcel is inland.

Potts Junction was previously used for fuel storage and under Alternative 1 it would be used for utilities to support the main cantonment at NCTS Finegayan. See Volume 6 of this EIS/OEIS for the utilities impact assessment discussion.

Non-DoD Land

Former FAA

The acquisition of the Former FAA parcel would be a significant impact on land ownership if the landowner were forced to sell or relocate, or if access to the site would be restricted to authorized personnel. As the parcel would extend from Route 3 to the coastline, but development would not extend beyond the cliffline toward the ocean, no new restrictions on access would be generated. The Navy controls the adjacent submerged lands and no acquisition of submerged lands is proposed. No farmlands were identified at the site; therefore no impact on FPPA is anticipated. A beneficial land use impact would be the elimination of the existing gap between NCTS Finegayan and South Finegayan and the formation of a contiguous base.

The property is vacant (i.e., no modern manmade structures) but portions are disturbed as a result of historical FAA use. The Former FAA parcel and property south of the parcel is within the Dos Amantes Planning Area that would include residential, tourism, and commercial land uses. The proposed use of the

Former FAA parcel is for the main cantonment, primarily community support, and bachelor housing components, which are compatible with the Dos Amantes Plan land uses. Decontamination training at the Main Cantonment would not impact land use. The Dos Amantes Plan does not specifically call out the educational and recreational uses of open space at the site. The loss of open space at the parcel would be an adverse impact, but not a significant one, since there are plans for development of the area under the No Action Alternative. No impacts to the DoD submerged lands adjacent to the parcel are anticipated, and no significant impacts were identified relative to changes in land use under Alternative 1.

GLUP 77

None of the action alternatives propose acquisition or long-term leasing of GLUP 77; however, Alternative 1 does result in the parcel being bounded by federal land in three directions and the Philippine Sea to the west. This would create a pocket of non-federal land of the GLUP 77 parcel. Navy submerged lands are on the western boundary of the parcel. This pocket of non-DoD land represents an adverse land use impact on the future use of the GLUP 77 parcel. The degree to which the property would be surrounded is considered a significant, but mitigable impact. Access to the parcel would be provided, but the access road from Route 3 would likely be less direct than the current access. The proposed surrounding federal uses are family housing and community support, which would be consistent with proposed development of GLUP 77 as part of the Dos Amantes Planning area that includes Hotel/Resort and Urban Center land use designations. There are cultural and natural resources that draw recreational and educational use. The affected area (undeveloped or residential with low to moderate density) would be mitigated by providing a fenced right-of-way access to the parcel. In addition, future development of GLUP 77 would benefit from having utility infrastructure installed nearby. With respect to land and submerged land ownership, less than significant adverse impact is anticipated.

Harmon

The acquisition of the Harmon property would be a significant impact on land ownership and access to the public would be restricted. No acquisition of submerged lands is proposed and the parcel does not border the ocean. The submerged lands in the vicinity are Navy-owned. USDA designated important farmlands were identified at the site. The community planned land uses at the property and adjacent are not consistent with this agricultural land designation. The area is not currently used for agriculture. This is an example of soils suitable for agriculture that would not be used for agriculture, either under the proposed action or no action. No impact on FPPA is anticipated. Acquisition would create a pocket of non-federal land as described under the GLUP 77 discussion.

Under Alternative 1, the proposed use of the Harmon property would be military family housing. This proposed land use is consistent with the Dos Amantes Planning area that includes Hotel/Resort and Urban Center land use designations. The development of vacant (i.e., no modern manmade structures) land represents a loss of open space and is an adverse impact. The impact would not be significant, since the Dos Amantes future Hotel/Resort and Urban Center land use designations are compatible with the proposed military family residential land use. The acquisition would not extend to the coastline and no impacts on submerged lands are anticipated.

8.2.3.2 Central

Andersen South

Andersen South is not on a coast; therefore, there are no submerged lands associated with it. No change in land ownership is proposed at Andersen South, and no pockets of non-federal land would be generated, once the U.S. Department of Education (DOE) land swap is completed with the Guam Department of

Education. There are no farmlands onsite; therefore, FPPA is not relevant. No significant impacts are expected.

Andersen South would be developed as a non-firing training range complex under Alternative 1. The majority of the site is vacant (i.e., no modern manmade structures). The abandoned buildings and vacant (i.e., no modern manmade structures) lands are presently used for non-firing training. A perimeter fence would restrict access to the site. Any agricultural leases that remain at the time of construction would be terminated by the Air Force. This would not be a significant impact because there are other lands available for agriculture.

The proposed land use at Andersen South is consistent with the existing use and no adverse impact is anticipated. An unimproved helicopter landing area would be sited in the area to minimize impact to other training uses. A perimeter fence would be constructed around Andersen South with a main gate and three range gates for access. There would be an increase in land use intensity under all action alternatives. The impacts of the change in land use intensity are addressed under other resource chapters of this EIS/OEIS.

The *North and Central Guam Land Use Plan* (Bureau of Statistics and Plans 2009) designated the adjacent land uses as residential with some exceptions. Along the northern boundary are two discrete land areas designated: Village Center, and Industrial. On the western boundary is an area of Commercial use. The proposed development of a non-firing training area is consistent with proposed residential land use on adjacent property. Andersen South would largely remain open space, with new roadways and minor support facilities, except for the redeveloped MOUT training compound, which would be a cluster of low-rise buildings in the southern area of the site. The development would not impact water production wells and transmission system onsite. The public high school would be sited to be compatible with the proposed training at the site.

Under Alternative 1, no significant impacts to land/submerged land ownership or use are anticipated at Andersen South.

Barrigada

The Navy and Air Force Barrigada parcels are contiguous federal lands. No change in land ownership is proposed and no new access restrictions would be generated. There are no farmlands onsite; therefore, FPPA is not relevant. The parcels are both landlocked; therefore, there are no associated submerged lands.

Alternative 1 would have no impact on existing or planned land use on either Barrigada parcel.

Non-DoD Land

Both training Alternatives A and B require acquisition of non-federal land located east of Route 15 and Andersen South. This would result in a significant but mitigable impact on land ownership, as described in the approach to analysis. Alternative B requires more land acquisition or long-term leasing than Alternative A. Access to property associated with either alternative would be limited to authorized personnel throughout most of the year. No pockets of non-federal land would be created, but there would be new restrictions on public access.

Access to historic sites, hiking trails and beach areas would require DoD approval and would be limited to periods of no training and subject to DoD approval. More specifics on access are provided in Volume 2, Chapter 12 (Cultural Resources) of this EIS/OEIS. No acquisition of submerged lands is proposed; however, the proposed firing ranges on the property would generate SDZ that extend into the submerged lands and access would be restricted during training. SDZs over navigable waters are controlled by USACE, which would publish a rule in the Federal Register per CFR Title 33 Navigation and Navigable

waters, Part 334, Establishment and Amendment Procedures in the Federal Register. In accordance with 33 CFR 334.480, designated areas encompassing the SDZs are restricted to navigation during periods when the ranges are in use. A NOTMAR /NOTAM is issued for every day the range is in use. The area would be monitored and if a vessel does enter the SDZ, firing must cease and the boat would be escorted out of the restricted area.

This added restriction to non-DoD submerged lands is considered an adverse impact to submerged lands use. Alternative B would encumber a larger area of submerged lands. Other EIS/OEIS chapters, including Volume 2, Chapter 9, Recreational Resources, discuss related impacts. No primary farmlands were identified at the site, but the area that was previously owned by the federal government, located along the east side of Route 15, is identified as important farmlands (refer to Figure 8.1-3). The *North and Central Guam Land Use Plan* (Bureau of Statistics and Plans 2009) designates these important farmland area and all of the Route 15 property adjacent to Route 15 for residential and park/open space land use, not agricultural use. No significant impact to FPPA is anticipated because there are no prime farmlands, no existing farms identified, and the planned land use designation is not agricultural.

If firing range Alternative A is selected, then a portion of Route 15 would be relocated to within Andersen South and the southeast corner of Andersen South would be incorporated into the live-fire training complex. There would be no change to Route 15 alignment if Alternative B is selected. In both alternatives, Route 15 would be the boundary between non-firing and firing range complexes. No adverse impact to land use would result from the relocated Route 15 because the route would be through existing DoD land and abandoned housing that is proposed for demolition. The realignment of Route 15 may result in impacts to other resource areas, such as traffic, that are addressed elsewhere in this EIS/OEIS.

Alternatives A and B would require relocation of the International Raceway Park and residences, affecting multiple landowners. The majority of the site is undeveloped. There are natural and cultural resources that encourage educational and recreational activities in the area. These activities would be suspended during training. In addition to the residential land use designation on the Route 15 property, the *North and Central Guam Land Use Plan* (Bureau of Statistics and Plans 2009) designates areas along the coast for Park/Open Space. The Residential and Park/Open Space designations extend northeast and southwest of Alternatives A or B property boundaries. The land disturbance required for firing ranges is concentrated at the firing points and targets, and perimeter access road and fencing. The majority of the site would remain naturally vegetated open space and encompass the SDZs. Live munitions training is not consistent with the planned residential land use at or adjacent to the Route 15 alternatives. On the other hand, most of the area that is required to accommodate the SDZ would be undeveloped and remain open space. Although the impact to land use could be considered beneficial with respect to maintaining open space, the impact analysis conservatively assumes there would be an adverse, but not significant, impact to land use based on incompatibility of training ranges and planned designated residential land use in the vicinity.

There would be noise generated at the proposed firing ranges. There are two major noise sources generated from small arms munitions firing. The first is the muzzle blast from the firing of a bullet. The second is the noise from the bow shock wave (also known as ballistic wave) generated by the super-sonic bullet. The bow shock wave propagates out from the path of the bullet. The bullet from an M16 has an exit velocity of approximately 3,100 ft (945 m) per second, but decelerates quickly. After approximately 3,937 ft (1,200 m), it is no longer flying at supersonic speeds and the shock wave would likely end within 6,562 ft (2,000 m).

Firing noise from single shots merged in bursts, machine gun burst, and concurrent firing of multiple weapons, as would occur at the proposed ranges, would result in short periods of intense firing followed by longer periods of silence. There is increased annoyance associated with this noise exposure pattern. Under these conditions, the number of shots becomes less important than the dB level of the typical (average) shot. It has been found that small arms fire is usually not a concern unless the linear peak sound pressure level of individual shots is above 85 dB PK 15(met).

The results of the modeling of Range Complex Alternatives A and B are provided in Figure 6.2-5. As described in Chapter 6, Noise, there are different criteria applied to ground training. Three noise zones are described. Zone II consists of an area where the DNL is between 65 and 75 dBA or 62 and 70 dBC, or the PK 15 (met) is between 87 to 104. Exposure to noise within this zone may be considered incompatible with noise-sensitive land uses and use of the land within the zone should normally be limited to activities such as industrial, manufacturing, transportation, and resource production (e.g., industrial parks, factories, and highways).

Under the Alternative A, the Zone II noise contours extend approximately 13,100 ft (4,000 m) beyond the eastern boundary of Route 15 lands and Zone III contours extend to just under 330 ft (100m) beyond the eastern edges of the Route 15 land. Alternative B would generate a Zone II extending 2,000-4,000 ft (600-1,200m) east of the Andersen South and Route 15 lands and approximately 4,600 ft (1,400m) west of the Route 15 boundary. The Zone II contour would extend approximately 230 ft (70m) across Route 15 just to the west of Andersen South. Both alternatives encompass lands designated for residential and open space park land uses. The residential land uses would be incompatible with the nuisance noise generated at the firing ranges. Alternative A would impact less area designated for residential land use. Based on the Guam (Bureau of Statics and Plans 2009) aerial photos there appears to be very low density residential structures in both alternatives, but fewer would be impacted under Alternative A. Most of the area is currently vacant.

Mitigation of such noise impacts are discussed further in Volume 2, Chapter 6 (Noise). While noise levels reach those considered incompatible with current land use, it is unlikely any civilians would be forced to relocate due to training operations, thus less than significant impact is likely.

Proposed training ranges on the west coast were eliminated from consideration because the proposed access restrictions would have significant adverse impacts on submerged lands use. There is less submerged lands activity on the east coast within the SDZ than the west coast, therefore the impact on submerged lands was minimized. The range complex development plan would be based on the minimal amount of land to be acquired to minimize the impact on land ownership and use. The restricted access to the Route 15 property would impact the educational and recreational activities, but limited access would be provided to the extent feasible, subject to DoD approval.

8.2.3.3 Harbor/Waterfront

No decision has been made in connection with the future reuse of the Former SRF lands to include continued leasing for commercial ship repair facility purposes beyond the current 2012 lease term expiration date. If the relocation of the USCG facility to within the current leasehold footprint was to occur during the current lease term, such action would be considered an adverse impact on the current lessee (and sublessee). This is a conservative assessment and assumes the lessee would prefer not to reduce the lease area, but does not evaluate the increase in efficiency that may result from consolidation of shipyard activities. The adverse impact would not be significant because: 1) the Navy is entitled to change the terms of the lease at lease renewal; 2) the sub-lessee would be able to continue ship repair operations with no reduction in capacity or service capability; and 3) existing access policies would be

retained. The current lease area is a pocket of non-federal land within the Navy Main Base and the reduced footprint would continue to have Navy land on all sides of the lease area with no adverse impacts on land use.

Existing buildings at the proposed USCG site would be demolished, some of which are being used by Guam Shipyard. The uses would be relocated and consolidated to facilities within the reduced lease footprint. Future DoD development at Former SRF would maintain the required AT/FP facility setback distances from civilian land uses with minimal impact on future development potential.

The military working dog kennel at Victor Wharf would be relocated to a place interior of the base (as discussed under Naval Base Guam). Relocations are typical of expanding bases. No significant impacts to land use are anticipated.

The proposed improvements to existing wharves under Alternative 1 in Inner Apra Harbor are consistent with the existing Navy harbor land uses. Dredging activities (from -35 MLLW to -38 MLLW at Sierra Wharf) in active Navy harbors are typical to support deeper draft ships and to maintain construction depth.

The Landing Craft Air Cushion/Amphibious Assault Vehicle (LCAC/AAV) laydown area is a new land use within Inner Apra Harbor. The vacant (i.e., no modern manmade structures) land is naturally vegetated. It would be developed with parking areas and support buildings representing a minor loss of open space to construct facilities typical of an active harbor. A new access road would also develop vacant (i.e., no modern manmade structures) land with minor impact on land use.

The support facilities at Victor Wharf and the cargo staging area would involve new uses on areas that have been disturbed by previous activities. There would be a minor loss of open space in the industrial area that is underutilized. No significant impacts to land use are anticipated.

No new training activities are planned in the submerged lands of Apra Harbor. Access to Inner Apra Harbor would continue to be restricted to authorized military ships. No projects are proposed in Outer Apra Harbor to support the Marine Corps relocation. There would be no significant impacts.

Naval Base Guam

The proposed projects at Apra Harbor are the same under all action alternatives. No submerged land acquisition is proposed. No farmlands are located on base; therefore FPPA is not relevant. No change to the access policy is proposed. All projects are proposed interior to the base, not in the vicinity of adjacent non-federal properties. All proposed projects and land uses are consistent with the Naval Base Guam land use plan. No significant impacts would occur.

There is adequate area for construction staging at the project sites. The proposed projects are sited to be consistent with the Navy Base Land Use Plan. The military working dog kennel would be located on vacant (i.e., no modern manmade structures) grassed land within the Industrial Support area of the base. The area is isolated from other facilities, which provides a suitable quiet environment for the dogs.

The Apra Harbor Medical/Dental Clinic would be appropriately sited on the edge of Fleet/Community Support area. The clinic site is vacant (i.e., no modern manmade structures), but previously developed as a public works site.

Use of Orote Airfield for helicopter landings is consistent with existing helicopter training that occurs on the airfield.

Dredged material management alternatives are described in Chapter 2 and Volume 9, Appendix D. No impact analysis is provided on beneficial reuse projects because there are no specific projects to be implemented. However, potential beneficial use projects are listed below. The USEPA designated ODMDS is beyond the Navy and territory submerged lands boundary. The potential impacts of the designation of the ODMDS are addressed in a separate EIS (USEPA 2009). The use of an EPA designated ODMDS would have no impact on submerged land use. The site was specifically selected to avoid submerged land use impacts (USEPA 2009). The ODMDS has sufficient capacity for the dredged material. Only sediment determined to be acceptable, through laboratory analysis, would be permitted by USACE to be disposed in the ODMDS.

The feasible upland placement sites are Fields 3, 4, 5, Public Works Center and Polaris Point as shown in Volume 2, Figure 2.5-3. Note that the PAG upland placement site is not retained in this impact analysis because it is not on Navy land. The landowner would be responsible for National Environmental Policy Act (NEPA) documentation for use of the site. One specific upland placement site or specific combination of sites is not provided in this EIS/OEIS; rather a range of sites is proposed. As noted in detail in Volume 9 Appendix D, there is sufficient capacity, with berm modification, in the Polaris Point and Field 5 sites individually to contain 100% of the total volume of the dredged material for any alternative selected for both Inner and Outer Apra Harbor dredging.

Beneficial Reuse

Between 1 to 1.1 million cubic yards (CY) of dredged material would be excavated from the Inner and Outer Apra Harbor for the proposed Navy and Marine Corps actions. The dredged material is expected to consist of a mixture of sediments including sand from the outer harbor and silts/clays from the inner harbor. Additionally, there will be coral fragments and other submerged rubble that would be included in the volume of dredged material.

Beneficial use of portions of this total volume would be possible and several potential local projects have been identified. These local projects include:

- *Support shoreline stabilization below Aircraft Carrier Wharf:* As part of the construction process, some fill would be used with the rip rap stone that would be placed along the shoreline and under the wharf to support the piles. Approximately 40,000 CY of quarry stone in addition to an estimated 20,000 CY of rip rap stone is envisioned for this stabilization purpose. It is possible that some of the rubble or some other suitable material from the dredged material could be used and mixed in below the quarry stone layer. Therefore, it is estimated that approximately 50% of the quarry stone amount or 20,000 CY of the dredged material could be used.
- *Fill of berms and backstops at proposed military firing ranges on Guam:* There are a number of berms and backstops that would be constructed as part of the development of new military firing ranges on Guam. The berms range in length from 35 to 255 ft (11 to 78 m); 7 to 56 ft (2 to 17 m) in width; and 3 to 7 ft (1 to 2 m) in height. Fill would be used to create these earthen mound structures. The volume within these berms and backstops has been calculated and equals an estimated 160,000 CY.
- *Port Authority of Guam (PAG) expansion program:* The PAG has prepared a Master Plan that includes a proposed 18-acre (7-ha) area for expansion of fast land to support new commercial port cargo handling in Apra Harbor. The potential in-water expansion project is a major endeavor that may be subject to cost, feasibility and ecological concerns and also require full environmental documentation by USACE and subsequent permit approval before

implementation. Up to 1.5 million CY of artificial fill would be needed to create this new land if this PAG expansion program comes to fruition. The Navy has a memorandum of agreement with PAG to provide fill from proposed dredging projects should the material be deemed suitable and the timing and logistics of both projects work out.

Given the potential availability of these upland beneficial use projects on Guam, the following four scenarios are possible for the disposal or placement of the proposed dredging projects in the inner and outer Apra Harbor:

- 100% beneficial use with all dredged material being used as artificial fill for the PAG expansion program (either direct waterfront placement or following placement at PAG upland placement site)
- 20-25% beneficial use of dredged material in berm construction and under wharf for shore and pile stabilization (assumes no PAG need and/or logistics/approval problems for use of fill) and 75 to 80 % ODMDS placement;
- 100% upland placement on existing Navy confined disposal facilities on base on Apra Harbor; and
- 100% placement in the Guam ODMDS.

All candidate upland sites are described, but only one of the upland sites would be required to accommodate the Sierra Wharf dredged volume (Volume 2, Figure 2.5-3). The upland placement sites are considered temporary (3 to 4 years), but could be reused for future dredging projects. The sites are all currently vacant (i.e., no modern manmade structures) and would be developed with bermed perimeters approximately 16 to 30 ft (5-9 m) in height. When the material is dry it can be beneficially reused or stockpiled temporarily. Based on preliminary sediment characterization (described in Volume 2, Chapter 4, Water Resources), the dredged materials would not require special treatment or handling and there is no anticipated long-term impact to land use. There would be no significant impact on future land use after the disposal site is removed.

The stockpiling of material in existing uplands placement sites is considered an adverse land use impact because developable land in an island environment is in short supply. Using developable land to stockpile material is not the best use of the land.

Upland placement sites appear as piles of wet sand within a grassed perimeter berm. From a land use perspective, upland placement sites do not preclude future use and would have no impact on adjacent uses. The stockpiling of material, including dredged material, tends to occur in operational, industrial, or remote areas primarily based on visual impact and ease of access. During construction of the upland placement facility and the dredging operations, there would be temporary impacts associated with on-base traffic on routes between the sites and the harbor.

Fields 3 and 5 and Polaris Point have been addressed in other NEPA documents. Though no significant land use impacts were identified, potential land use impacts associated with the sites are as follows:

- Polaris Point: The site is vacant (i.e., no modern manmade structures) and landscaped (grass). The land use designation at the site is Fleet/Community Support and Operations (refer to Figure 8.1-14). The recreational and operational uses at Polaris Point are outside the site boundaries. The upland placement site is temporary and would not preclude use of the areas for recreation in the future. No morale, welfare, and recreation (MWR) projects have been programmed in the area. The piles of drying dredged material would be compatible with the industrial and Fleet/Community Support land uses in the vicinity. A helipad is being

- considered (not part of this proposed action) at the southern coast of Polaris Point, and no land use conflict is anticipated. There are minor remnant structures that would be removed. Water and sewer lines would be realigned. The Polaris Point site was considered for the Inner Apra Harbor maintenance dredging project. No adverse impacts to land use were identified in the *Final Environmental Assessment Inner Apra Harbor Maintenance Dredging, Guam, Department of Navy, October* (Navy 2003).
- Field 5: The potential environmental impacts of using Field 3 and Field 5 are addressed in the P-431, *Alpha-Bravo Wharves Improvements Environmental Assessment* (COMNAV Marianas 2006). Portions of Field 5 were used for the placement of dredged material from the P-431 project. 75% of the site was cleared of tangantangan forest for the P-431 project and the remainder would be cleared if Site 5 were selected for the proposed action. The proposed use is consistent with the Industrial Support land use designation (refer to Figure 8.1-14). Expansion of an existing upland placement site is consistent with the existing land use and surrounding operational uses. There is a sanitary sewer and overhead power line at Field 5 that would be relocated.
 - Field 3: Field 3 is vacant (i.e., no modern manmade structures) and landscaped (grass). The land use designation at the site and vicinity is Fleet/Community Support (refer to Figure 8.1-14). The retail center buildings in the vicinity include the Exchange and the Commissary. The site is remote from the retail facilities and pedestrian retail traffic. The piles of drying material at the upland placement site would be compatible with retail facility and parking lots in the vicinity. No land use impact on existing facilities is anticipated. There is an underground water line along the boundary of Field 3 that would be relocated.
 - Public Works Center (PWC): The PWC site is within the Navy's Operational land use designation (refer to Figure 8.1-14). The site was previously used as the PWC compound for the base and there are remnant structures and concrete pads that would be removed. There is a sewer line along the southern boundary that would be retained. The proposed use of the site is consistent with its Operations land use designation. A new Apra Medical/Dental Clinic is proposed on the eastern boundary of the site. The piles of drying material would have no impact on the medical/dental clinic land use.
 - Field 4: Field 4 would require relocation of overhead power lines, and underground sewer and water lines. The proposed use is consistent with the Industrial Support designation on the Navy Land Use Plan. The site was reduced on the southern end to accommodate the relocation of the military working dog kennel from Victor Wharf. The two land uses are compatible.

No significant impact to land use would result from the use of any of the candidate upland placement sites. The use of the sites would be considered temporary. No long-term environmental impacts are anticipated at the sites, based on preliminary sediment sampling and analysis data. After the dried material is removed from the site, additional sampling would be conducted prior to the site being reused to ensure the environmental conditions were suitable for the specific land use proposed. No constraints on future land uses at former upland placement sites are anticipated.

Opportunities for beneficial reuse of the dredged material would be identified during design to reduce the amount of land required for upland placement. The upland placement sites were subject to a screening analysis that included potential impact to land use. Upland placement of dredged material would be minimized by disposing of suitable dredged material into the ODMDS. Only one of the candidate upland placement sites would be required to accommodate the entire Sierra Wharf dredged volume. The site

would be sized to meet the project requirements; therefore, only a portion of an upland placement site may be developed. This would minimize the impacts on the amount of vacant (i.e., no modern manmade structures) land being developed.

The impact on the GEDCA lease is unavoidable. The reduction in non-DoD land use is an adverse impact. This is a conservative assessment and assumes the lessee would prefer not to reduce the lease area, but does not evaluate the increase in efficiency that may result from consolidation of shipyard activities. The adverse impact would not be significant because: 1) the Navy is entitled to change the terms of the lease at lease renewal; 2) the sub-lessee would be able to continue ship repair operations with no reduction in capacity or service capability; and 3) existing access policies would be retained. The reduced lease footprint has the beneficial impact of increasing land use efficiency in the area.

No significant impacts to land or submerged lands ownership or use were identified under Alternative 1 at Apra Harbor and no mitigation is proposed. The projects proposed are all compatible with adjacent land uses.

8.2.3.4 South

NMS

NMS is Navy property. No submerged lands would be affected, and no farmlands are designated at NMS. The proposed munitions storage facilities and the maneuver training are consistent with the existing land uses. The storage facilities are sited to meet explosive safety criteria in the vicinity of other storage facilities in the northern portion of NMS. The ESQD arcs generated by the new storage facilities would not increase the existing encroachment on non-DoD property. There would be a less than significant impact associated with the loss of open space.

The proposed unimproved helicopter landing zone would be sited on vacant (i.e., no modern manmade structures) land in an area that meets explosive safety requirements.

Maneuver training areas exist at NMS, but intensity of use would increase in the SLNA (refer to Figure 8.1-18). The location for training is selected because it is in its natural undeveloped state and provides a realistic training experience. Except for a parking area, the training area would be maintained in the naturally vegetated open space state.

No significant impact to land use or ownership at NMS is anticipated.

Non-DoD

An access road is proposed for the southern portion of NMS through non-federal land, and would require an easement or other instrument to provide unrestricted access to the proposed access road. Two alternatives are proposed, improved and unimproved, but from a land ownership perspective there would be no difference between them. The federal acquisition of land represents an adverse impact assuming the landowner does not wish to sell their land. However, the area required is small relative to other land acquisitions under the proposed action and is considered a less than significant impact.

Alternative A is improved and Alternative B is unimproved. Both alternatives would have the same alignment. No prime or important farmlands would be impacted. There would be no significant impacts.

8.2.3.5 Summary of Impacts

All action alternatives have significant impacts on land ownership, because the approach to analysis assumes the forced sale of land by the federal government for the firing range complex and roadway improvements. Alternative 1 requires additional federal acquisition of non-DoD land for developing the

main cantonment area. Submerged lands would not change ownership. The new range complex would restrict land and submerged land access during training events, which would occur most of the year. As part of the alternatives considered and dismissed analysis, a range of land acquisition options was proposed. The goal was to minimize the area of land to be acquired, maximize the use of existing DoD facilities, and minimize the effects on submerged lands use, while maintaining operational effectiveness and minimizing impacts on other resource categories (i.e., biological resources). For example, developing firing ranges on the west coast in the north was considered and dismissed to avoid submerged land and land ownership impacts. The existing firing range and associated SDZ would be removed from the west coast, which would have a beneficial impact on submerged land use.

The less than significant impact for land ownership at Apra Harbor is based on the reduced GEDCA lease area for USCG relocation; however the lease would likely be negotiated anyway in 2012. There would only be an impact if the lease were terminated early, before 2012 as a result of the proposed action.

8.2.3.6 Potential Mitigation Measures

Businesses and residences would be relocated and financial compensation would be made to landowners. To mitigate significant impacts of forced land acquisition, DoD could consider entering into long-term lease arrangements with the affected landowners in those situations where such an arrangement could be feasible. No additional mitigation has been proposed for affected landowners releasing their land.

Though impacts regarding access to land parcel and roads were not considered significant, the following would further minimize impacts:

- Access to the Route 15 property for appreciation or study of cultural and natural resources would be granted on request when there are no conflicts with training operations.
- Access to the GLUP 77 parcel would be provided to minimize the impact creating a non-DoD pocket of land.
- Proposed access road would be shared with the public if such use does not conflict with military operations.

8.2.4 Alternative 2 (Preferred Alternative)

Alternative 2 is similar to Alternative 1 with one notable exception. The Harmon property would not be acquired under Alternative 2. There would be no pocket of federal land created around GLUP77.

8.2.4.1 North

Andersen AFB

Land use impacts to Andersen AFB and adjacent properties are as described under Alternative 1.

Finegayan

The land/submerged lands ownership and use impacts are as described for Alternative 1, except the area of NCTS Finegayan that would be developed would be approximately 421 ac (171 ha) greater than described for Alternative 1. There would be an additional loss of open space than that described in Alternative 1. The loss of open space is considered an adverse but not significant impact.

Land use impacts to Potts Junction and adjacent properties are as described under Alternative 1.

Non-DoD Land

Land use impacts to Former FAA and adjacent properties are as described under Alternative 1.

GLUP 77 would not be acquired under any of the action alternatives. Under Alternative 1, with the acquisition of Harmon property, a pocket of non-federal land surrounded by federal land would be created. Under Alternative 2, GLUP 77 would not be a pocket of non-federal lands. No significant impact to GLUP 77 land use is anticipated.

The Harmon property would not be acquired. There would be no land use impacts to the property and adjacent properties.

8.2.4.2 Central

Andersen South

Land use impacts to the Andersen South properties and adjacent properties are as described under Alternative 1.

Barrigada

Land use impacts to the Barrigada properties and adjacent properties are as described under Alternative 1.

Non-DoD

Land use impacts to Route 15 property and adjacent properties are as described under Alternative 1.

8.2.4.3 Apra Harbor

The land and submerged land ownership and use impacts are as described under Alternative 1. Mitigation measures are as described under Alternative 1.

8.2.4.4 South

Land use impacts to NMS are as described under Alternative 1.

8.2.4.5 Summary of Impacts

Land/submerged land ownership/use impacts under Alternative 2 are similar to impacts under Alternative 1.

8.2.4.6 Potential Mitigation Measures

Potential mitigation measures are as described under Alternative 1, except there would be no mitigation required for GLUP 77 surrounding land uses. There would be less land acquired which would minimize the impact, but overall there remains a significant mitigable impact associated with forced sale of land to the federal government.

8.2.5 Alternative 3

Alternative 3 differs from Alternatives 1 and 2 in that no land acquisition by the federal government is proposed for the main cantonment area. The Barrigada area that was not proposed for development under Alternatives 1 and 2 is proposed for development under Alternative 3. There would be land acquisition for the firing range complex as described under Alternative 1.

8.2.5.1 North

Andersen AFB

Land use impacts to Andersen AFB and adjacent properties are as described under Alternative 1.

Finegayan

The land/submerged lands ownership and use impacts are as described for Alternative 2.

Land use impacts to Potts Junction and adjacent properties are as described under Alternative 1.

Non-DoD Land

The Former FAA property would not be acquired and the existing gap between NCTS Finegayan and South Finegayan would remain. There would be no adverse or significant impacts associated with Former FAA property.

GLUP 77 impacts are as described under Alternative 2. No adverse impact to GLUP 77 land use is anticipated.

The Harmon property would not be acquired. There would be no land use impacts to the property and adjacent properties.

8.2.5.2 Central

Andersen South

Land use impacts to the Andersen South properties and adjacent properties are as described under Alternative 1.

Barrigada

The Navy and Air Force Barrigada parcels are contiguous federal lands. No change in land ownership is proposed and no pockets of non-federal land or changes to access policies would be generated. There are no farmlands; therefore, FPPA is not relevant.

Alternative 3 proposes family housing on underutilized vacant (i.e., no modern manmade structures) lands on both Barrigada parcels. No relocations would be required. There would be a change in the intensity of land use under Alternative 3. The proposed development would be on previously developed land that was historically used for Air Force family housing. The Next Generations Radar weather facility is the primary activity at the Air Force Barrigada site and can remain at the site with no significant impact to or from the proposed land use. There may be design restrictions on the housing units.

The family housing area proposed at Navy Barrigada would be on vacant (i.e., no modern manmade structures) land. Adjacent land uses within the parcel boundary are communication facilities, Army administrative facilities, and the Navy golf course. Civilian residential development is located adjacent and north. The proposed land use is compatible with the adjacent land uses. There may be limitations on the area available for development pending results of a study on EMR emissions from the communications facilities. No adverse land use impact would result from family housing development at Navy Barrigada.

There would be a loss of open space at both parcels that is considered an adverse impact. The impact is not significant because the property is within federal lands. The potential impacts of changes in land use intensity (i.e., traffic, noise) are addressed in other resource chapters.

The adjacent non-DoD land uses are residential. The *North and Central Guam Land Use Plan* (Bureau of Statistics and Plans 2009) designates the area surrounding the both Barrigada parcels as Low Density Residential, except for a commercial area northeast of Navy Barrigada. The proposed land use is consistent with the adjacent land uses.

Non-DoD Land

Land use impacts to Route 15 property and adjacent properties are as described under Alternative 1.

8.2.5.3 Apra Harbor

The land and submerged land ownership and use impacts are as described under Alternative 1. Mitigation measures are as described under Alternative 1.

8.2.5.4 South

Land use impacts to NMS and adjacent non-DoD properties are as described under Alternative 1.

8.2.5.5 Summary of Impacts

Land/submerged land ownership/use impacts under Alternative 3 is similar to impacts under Alternative 1.

8.2.5.6 Potential Mitigation Measures

There would be less land acquired for main cantonment, thereby avoiding some of the impact associated with the land ownership criteria. There would still be significant, but mitigable impacts associated with the firing range complex land acquisition. There would be less than significant impacts due to loss of open space at Barrigada. All other mitigations are as described under Alternative 1.

8.2.6 Alternative 8

Alternative 8 is similar to Alternatives 1, 2 and 3 in that Main Cantonment is on the west coast and land acquisition is as described for Alternative 2. The unique aspect of this Alternative is the division of family housing and community support facilities between the east and west areas of Guam.

8.2.6.1 North

Andersen AFB

Land use impacts to Andersen AFB and adjacent properties are as described under Alternative 1.

Finegayan

The land/submerged lands ownership and use impacts are as described for Alternative 1.

Land use impacts to Potts Junction and adjacent properties are as described under Alternative 1.

Non-DoD land

The land acquisition is as described for Alternative 2.

The Former FAA property would be acquired with potential impacts as described under Alternative 1.

GLUP 77 impacts are as described under Alternative 2. The adjacent federal uses would be housing and community support. No adverse impact to GLUP 77 land use is anticipated.

The Harmon property would not be acquired. There would be no land use impacts to the property and adjacent properties. GLUP 77 parcel would not become a pocket of non-federal land.

8.2.6.2 Central

Andersen South

Land use impacts to the Andersen South properties and adjacent properties are as described under Alternative 1.

Barrigada

The Navy and Air Force Barrigada parcels are contiguous federal lands. No change in land ownership is proposed. No pockets of non-federal land or changes to public access would be generated. There are no farmlands; therefore, FPPA is not relevant.

Alternative 8 is similar to Alternative 3 in that the Air Force Barrigada parcel would be developed for housing and community support land uses. The impacts associated with development of the Air Force Barrigada parcel are as described under Alternative 3.

Unlike Alternative 3, but similar to the other action alternatives, Navy Barrigada would not be developed to support the proposed action. There would be no land use impacts.

Non-DoD Land

Land use impacts to Route 15 property and adjacent properties are as described under Alternative 1.

8.2.6.3 Apra Harbor

The land and submerged land ownership and use impacts are as described under Alternative 1.

8.2.6.4 South

Land use impacts to NMS and adjacent non-DoD properties are as described under Alternative 1.

8.2.6.5 Summary of Impacts

Land/submerged land ownership/use impacts under Alternative 8 is similar to impacts under Alternative 1.

8.2.6.6 Potential Mitigation Measures

The mitigation measures are as described for Alternative 1, except there would be less land acquired for main cantonment and there would be less than significant impacts associated with the loss of open space at Barrigada.

8.2.7 No-Action Alternative

Under the no-action alternative, Marine Corps units would remain in Japan and would not relocate to Guam, though they may continue to train on Guam as they currently do. No additional training capabilities (beyond what is proposed in the MIRC EIS/OEIS [Navy 2009]) would be implemented for Guam to support the proposed action. The project objectives, including U.S.- Government of Japan agreements, would not be met. There would be no land acquisition or long term leasing, dredging, new construction or infrastructure upgrades associated with Marine Corps forces stationed on Guam.

8.2.7.1 North

No change in land or submerged land ownership would occur at NCTS Finegayan, South Finegayan, Potts Junction, Former FAA, GLUP 77 or Andersen AFB. There are no farmlands used or proposed for agricultural use; therefore, FPPA is not relevant. No of non-federal land or changes in public access would be generated by the use of these existing federal parcels. Vacant non-DoD lands are subject to

planned development; therefore the open space and vacant (i.e., no modern manmade structures) lands would be developed over time.

The programmed Air Force projects would proceed as planned. The Navy helicopter facilities at North Ramp would not be relocated. The Air Force would proceed to develop the air embarkation facility on South Ramp, but it would be smaller compared to the joint facility proposed under the action alternatives. The new access gate and truck inspection facility at Andersen AFB would be constructed to address existing traffic issues, but would not be a priority project. No adverse land or submerged lands ownership or use impacts were identified.

8.2.7.2 Central

Andersen South, Navy Barrigada and Air Force Barrigada land uses including training described in the MIRC EIS (Navy 2009) would continue. No significant land or submerged land ownership or use impacts were identified under the no-action alternative at Andersen South.

No land would be acquired by the federal government. No relocations of roads, businesses or residences would be required. Over time land would be developed in accordance with approved land use plans as open space and residential land uses. There would be no impact on access to the area on land or submerged land. No significant land or submerged land ownership or use impacts were identified under the no-action alternative at Route 15 property.

8.2.7.3 Apra Harbor

The training described in the MIRC EIS (Navy 2009) would continue. Inner Apra Harbor wharves would be repaired and upgraded as described under the proposed action, but improvements would support the Navy mission and occur over a longer time period.

The Guam Economic Development and Commerce Authority lease area would be reduced as planned during the planned renegotiation in 2012 with no impact to land ownership. Upland placement sites for dredged material would continue to be required to support periodic maintenance dredging and planned construction dredging.

8.2.7.4 South

NMS would continue to be used for munitions storage and training as described in the MIRC EIS (Navy 2009). New munitions storage facilities would be required, but the requirement would be met over a longer period of time. No new access roads to the southern portion of the NMS would be required and no land would be acquired.

8.2.7.5 Summary of No-Action Alternative Impacts

No change in land ownership and access would occur. The open space areas would remain undeveloped until other uses are proposed. The waterfront improvements would likely occur at a more gradual schedule as funding permits. The small arms range and SDZ at Finegayan would remain and the access restrictions on recreational use of DoD submerged lands would continue.

8.2.8 Summary of Impacts

Tables 8.2-1, 8.2-2, 8.2-3, and 8.2-4 summarize the potential impacts of each action alternative associated with the Main Cantonment, firing range training, ammunition storage, and NMS access roads. Table 8.2-5 summarizes the potential impacts of other training, airfield, and waterfront components of the proposed action. The tables summarize the results of the land and submerged land ownership and land use impact analysis presented in previous sections by alternative. Adverse impacts and significant impacts shown on

the tables represent the maximum adverse environmental effect identified in all regions under each alternative. If an alternative had significant impacts in only one region for one criterion, then the criterion is scored as significant impact in the tables. A text summary is provided below.

Table 8.2-1. Summary of Main Cantonment Impacts – Alternatives 1, 2, 3 and 8

<i>Main Cantonment Alternative 1 (North)</i>	<i>Main Cantonment Alternative 2 (North)</i>	<i>Main Cantonment Alternative 3 (North/Central)</i>	<i>Main Cantonment Alternative 8 (North/Central)</i>
Construction			
NI <ul style="list-style-type: none"> There would be no impacts due to construction 	NI <ul style="list-style-type: none"> There would be no impacts due to construction 	NI <ul style="list-style-type: none"> There would be no impacts due to construction 	NI <ul style="list-style-type: none"> There would be no impacts due to construction
Operation			
LSI <ul style="list-style-type: none"> Less than significant impact due to loss of vacant land/open space SI-M <ul style="list-style-type: none"> Significant impact to land ownership if forced sale of land at Former FAA and Harmon parcels to government for main cantonment* Significant, but mitigable impact due to limiting access to GLUP 77 NI <ul style="list-style-type: none"> No impact to submerged lands ownership and management No impact to FPPA BI <ul style="list-style-type: none"> Beneficial impact to DoD submerged land use due to SDZ removal 	LSI <ul style="list-style-type: none"> Less than significant impact due to loss of vacant land/open space SI-M <ul style="list-style-type: none"> Significant impact to land ownership if forced sale of land at Former FAA and Harmon parcels to government for main cantonment* Significant, but mitigable impact due to limiting access to GLUP 77 NI <ul style="list-style-type: none"> No impact to submerged lands ownership and management No impact to FPPA BI <ul style="list-style-type: none"> Beneficial impact to DoD submerged land use due to SDZ removal 	LSI <ul style="list-style-type: none"> Less than significant impact due to loss of vacant land/open space NI <ul style="list-style-type: none"> No impact to land ownership and management at Former FAA and Harmon parcels NI <ul style="list-style-type: none"> No impact to submerged lands ownership and management No impact to FPPA BI <ul style="list-style-type: none"> Beneficial impact to DoD submerged land use due to SDZ removal 	LSI <ul style="list-style-type: none"> Less than significant impact due to loss of vacant land/open space NI <ul style="list-style-type: none"> No impact to land ownership and management at Former FAA and Harmon parcels NI <ul style="list-style-type: none"> No impact to submerged lands ownership and management No impact to FPPA BI <ul style="list-style-type: none"> Beneficial impact to DoD submerged land use due to SDZ removal

* As described in the approach to analysis, assume forced sale of land to federal government is an adverse impact to the landowners, pending completion of land negotiations.

Legend: SI = Significant impact, SI-M = Significant impact mitigable to less than significant, LSI = Less than significant impact, NI = No impact.

Table 8.2-2. Summary of Training Impacts – Firing Range Alternatives

<i>Firing Range Alternative A (Central)</i>	<i>Firing Range Alternative B (Central)</i>
Construction	
NI • There would be no impacts due to construction	NI • There would be no impacts due to construction
Operation	
LSI • Less than significant impact to non-DoD land use because the firing range would be inconsistent with surrounding designated land uses • Adverse impact to non-DOD submerged lands use and restricted land access due to training ranges SI-M • Significant impact to land ownership if forced sale of land to federal government for firing ranges* NI • No impact to submerged land ownership or management	LSI • Less than significant impact to non-DoD land use because the firing range would be inconsistent with surrounding designated land uses • Adverse impact to non-DOD submerged lands use and restricted land access due to training ranges SI-M • Significant impact to land ownership if forced sale of land to federal government for firing ranges* NI • No impact to submerged land ownership or management

* As described in the approach to analysis, assume forced sale of land to federal government is an adverse impact to the landowners, pending completion of land negotiations.

Legend: SI = Significant impact, SI-M = Significant impact mitigable to less than significant, LSI = Less than significant impact, NI = No impact.

Table 8.2-3. Summary of Training Impacts – Ammunition Storage Alternatives

<i>Ammunition Storage Alternative A (South)</i>	<i>Ammunition Storage Alternative B (South)</i>
Construction	
NI • There would be no impacts due to construction	NI • There would be no impacts due to construction
Operation	
LSI • Less than significant impact to land use due to loss of open space	LSI • Less than significant impact to land use due to loss of open space

Legend: LSI = Less than significant impact, NI = No impact.

Table 8.2-4. Summary of Training Impacts – NMS Access Roads Alternatives

<i>Access Road Alternative A (South)</i>	<i>Access Road Alternative B (South)</i>
Construction	
NI • There would be no impacts due to construction	NI • No construction
Operation	
LSI • Less than significant impact to land use due to land acquisition or long-term leasing for access road to NMS	LSI • Less than significant impact to land use due to land acquisition or long-term leasing for access road to NMS

Legend: LSI = Less than significant impact, NI = No impact.

Table 8.2-5. Summary of Other Training, Airfield, and Waterfront Component Impacts

<i>Other Training (North/Central/South)</i>	<i>Airfield (North)</i>	<i>Waterfront (Apra Harbor)</i>
Construction		
NI <ul style="list-style-type: none"> There would be no impacts due to construction 	NI <ul style="list-style-type: none"> There would be no impacts due to construction 	NI <ul style="list-style-type: none"> There would be no impacts due to construction
Operation		
LSI <ul style="list-style-type: none"> Less than significant impact to land use due to loss of agricultural lease and open space 	LSI <ul style="list-style-type: none"> Less than significant impact to DoD land use from airfield noise encroachment 	LSI <ul style="list-style-type: none"> Less than significant impact if GEDCA lease is renegotiated prior to 2012 Less than significant impact to land use due to loss of open space

Legend: LSI = Less than significant impact, NI = No impact.

The land use analysis assumes that all construction staging would be within the project footprint on land planned for development. No adverse land use impacts associated with construction are anticipated. This assumption applies to all alternatives. The analysis is generally based on operational use, with dredged material management activities in Apra Harbor being the exception.

The land use analysis assumes that all impacts would be long-term and direct. Short-term construction-phase impacts would occur within the project footprint on land planned for development. In the case of upland placement of dredged material, the construction impact would be within the upland placement sites construction area. Indirect impacts related to changes in land ownership/use are addressed in other resource chapters (e.g., noise, socioeconomics, biology). Other than financial compensation to landowners, no mitigation is proposed for changes in land ownership. The development plan is based on the minimal amount of land to be acquired to minimize the impact on land ownership. The impacts for all action alternatives are the same for Apra Harbor, Andersen AFB and NMS. All alternatives including the no-action alternative include acquisition of land for federal use. All alternatives, including the no-action alternative, could potentially reduce the footprint of the Guam Economic Development and Commerce Authority lease area at Apra Harbor. If the lease is negotiated prior to the 2012 scheduled re-negotiation date, a less than significant impact would result. The Navy would maintain building AT/FP setback distances from the civilian use in future construction; however this does not represent an impact as is standard building practice.

There would be no acquisition of submerged lands for federal use. When land or submerged land is acquired there are restrictions on access to or through the land that are associated with the acquisition and covered under the Land Ownership - Land and Submerged Land criteria. For those areas that are not acquired, but result in new access restrictions, the potential impact is adverse but less than significant. This is the case for all action alternatives where land on the east coast would be acquired for live-fire training and access to the adjacent GovGuam submerged lands would be restricted during training. Training ranges on the west coast were eliminated from further consideration because the restricted access policy would have significant impacts on submerged lands use. There is less submerged lands activity on the east coast within the SDZ than the west coast and the impact of the access restriction is not considered significant. Training would occur from 6:00 a.m. to 10:00 p.m., Monday through Friday (and on weekends if operationally required). The SDZ would potentially be accessible on weekends. A NOTAM would be issued to announce access limitations.

No prime farmlands would be impacted under any of the alternatives and the alternatives are consistent with FPPA.

Land use proposals on federal lands under all action alternatives are consistent with base land use plans; however, there is a loss of open space that is considered a less than significant adverse impact even if the proposed development area is not being used efficiently. The loss of open space is partially offset by the fact that increased utilization of federal land minimizes the need for land acquisition. Under the no-action alternative, DoD facility construction would occur resulting in the loss of open space; however the project construction would be more gradual and on a smaller scale. Some of the projects proposed under the various action alternatives would be constructed under the no-action alternative, but over a longer period of time.

A beneficial impact to DoD submerged lands was identified in the north with the elimination of the SDZ associated with the small arms range that would be relocated to the east coast.

Under all action alternatives, the training range complex land use is not consistent with adjacent existing (vacant and residential) and planned land uses (residential). With appropriate buffering, the proposed land use and the surrounding uses would be compatible. The impacts are not considered significant because the range facility development would be limited and the area encumbered by the SDZs would generally be retained as open space.

Under Alternative 1, the GLUP 77 parcel would be a pocket of non-federal land adjacent in three directions to federal land. No mitigation is proposed, but the impacts could be balanced by the beneficial impact of new utility infrastructure in proximity to GLUP 77 that would facilitate future use of the site. This impact is less than significant, but a fenced right-of-way with unrestricted access would be provided to the GLUP 77 parcel. No other action alternatives create this pocket of non-federal land at GLUP 77.

8.2.9 Summary of Potential Mitigation Measures

Table 8.2-6 summarizes the potential mitigation measures for each type of impact by alternative.

Table 8.2-6. Summary of Potential Mitigation Measures

<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Alternative 8</i>
Land Ownership and Management			
<ul style="list-style-type: none"> • Long-term lease instead of forced sale for federal use of land 	<ul style="list-style-type: none"> • Long-term lease instead of forced sale for federal use of land 	<ul style="list-style-type: none"> • Long-term lease instead of forced sale for federal use of land 	<ul style="list-style-type: none"> • Long-term lease instead of forced sale for federal use of land
<ul style="list-style-type: none"> • Recommend revision to community plans to address DoD land uses 	<ul style="list-style-type: none"> • Recommend revision to community plans to address DoD land uses 	<ul style="list-style-type: none"> • Recommend revision to community plans to address DoD land uses 	<ul style="list-style-type: none"> • Recommend revision to community plans to address DoD land uses